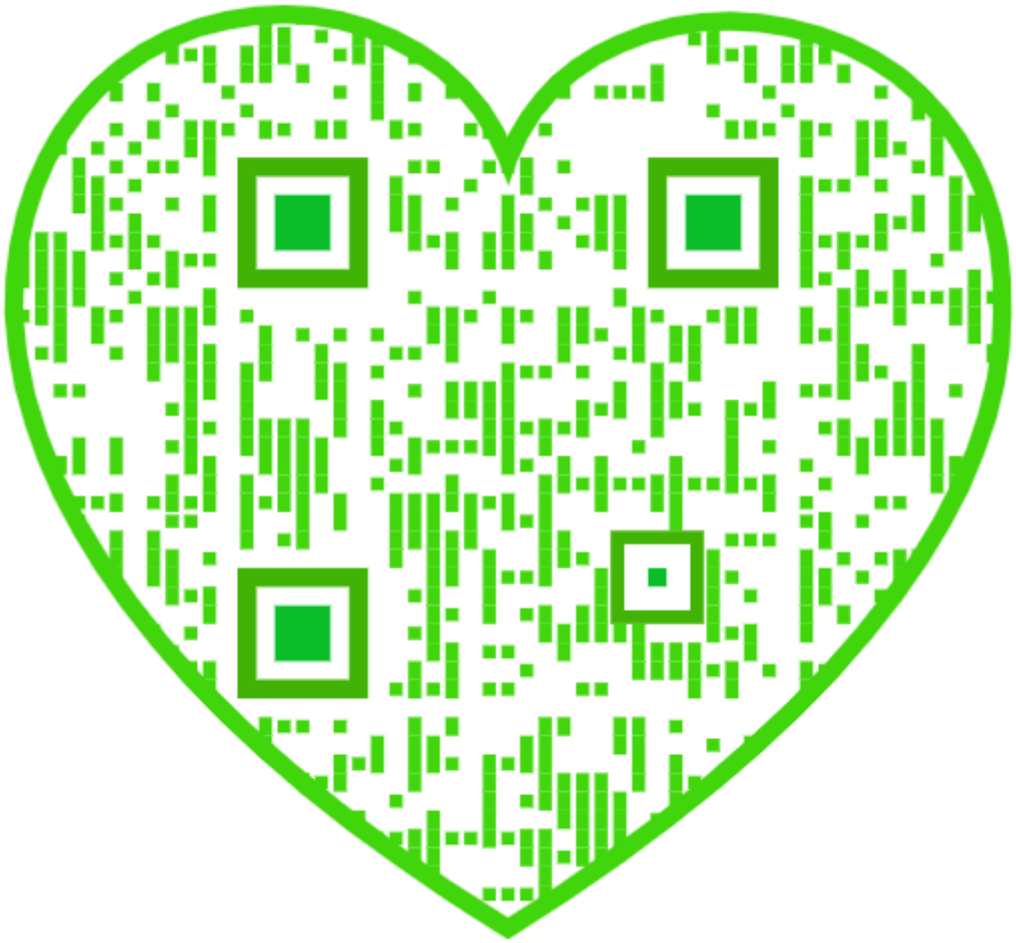

PHILIPPINE EDUCATION SERIES

PRIMARY ARITHMETIC

PARTS I AND II

BY

MABEL BONSALL, A.B.

FORMERLY TEACHER OF MATHEMATICS IN THE PHILIPPINE NORMAL SCHOOL, MANILA

REVISED EDITION

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PREFACE

THE Bonsall-Mercer Arithmetics cover the entire course in arithmetic for the primary and intermediate schools of the Philippine Islands. They aim to exclude cumbrous methods and useless material, and to appeal constantly to the pupil's ability to think.

The Primary books of this series are intended to supply the need long felt by both Filipino and American teachers for well-graded elementary arithmetics, written in simple language, and making use of material familiar to the Filipino pupil. A judicious combination of the spiral and topical methods has not only made the grading progressive and easy, but has made possible a presentation of essentials which the pupil can readily comprehend. By means of numerous illustrations and problems dealing with subjects in which the pupils have a genuine interest, the school work is connected with real Philippine life.

The Primary Arithmetic, Parts I to III, Revised Edition, appears in two volumes, Parts I and II being bound together and intended for use throughout the first and second grades.

Part I, Revised Edition, treats of numbers from 1 to 10. For first grade number work, the illustrations and suggestions for seat work make it a valuable book in the hands of the teacher. When placed in the hands of the pupil at the beginning of the second grade, it furnishes an adequate and interesting review of the first grade number work. Part II, Revised Edition, treats of numbers to 100. It includes elementary notions of fractions, and introduces the simpler units of the

metric system. This book is written in language so simple that it does not need to be interpreted to the pupil.

Part III, Revised Edition, has been extended to cover the work of both the third and the fourth grades. It completes the primary school study of the fundamentals, and introduces the essentials of common and decimal fractions, easy exercises in percentage and interest, and practical work in weights and measures.

In the revision of both of these books the authors have planned to give the pupils leaving school at the completion of the primary course a practical knowledge of the essentials of arithmetic, and at the same time to furnish a logical basis for the work offered in the intermediate grades. The revision has been made in accordance with the official recommendations of the Committee on Text-books, and the Committee on Primary Course of Study. The practice and drill work throughout has been greatly increased.

Grateful acknowledgment is made to the following teachers of Philippine experience, who read the manuscript and made valuable suggestions: William Hazen Eastman, O. S. Reimold, G. N. Tremper, Mrs. T. D. Anglemyer, J. M. Knisely, T. H. Rhodes, M. C. Helm, G. W. Beattie, and W. I. Chapman. For most helpful criticisms the thanks of the authors are also due John H. Walsh, Associate Superintendent of Schools, New York City, and author of a series of arithmetics; Dr. Richard G. Boone, editor of *Education*, Boston; Alexander B. Coffey, Professor of Education, College of William and Mary, Virginia; Dr. F. D. Strayer, Teachers College, Columbia University; Miss Laura Frazee, Primary Supervisor, Indianapolis; and Miss Belle Caffey, Critic Teacher, Indiana State Normal School.

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SUGGESTIONS TO TEACHERS

I. THE LESSON. — There are three parts to every lesson in arithmetic: the assignment, the preparation, and the recitation. For all three the teacher is largely responsible.

1. The Assignment. — Have clearly in mind what the lesson is to be. Tell your pupils in as few words as possible what you expect them to do. Keep in mind the length of time you expect the pupils to spend in preparing the lesson; give enough work to fill that time, and let the class understand that you expect *all* of the lesson to be written in *good form.* When a new subject is assigned, take five or ten minutes to show the pupils how to begin their preparation. Read carefully all the notes on a page, and the suggestions for seat work referred to in the notes, before assigning the lesson on that page.

2. The Preparation.

(*a*) *By the Teacher.* — Recall the points made in the last lesson, decide which points you will give as review in beginning the new recitation, then proceed with your preparation of the advance work. Get thoroughly in mind the subject-matter of the lesson, and then think out the manner of presenting it that will be best for your own class. The strength of your class will help you to determine whether some of the drill given in the text may be omitted or whether you should give supplementary work on a topic. If you think that supplementary work will be needed, have such work prepared, and know exactly what you are going to do when you go before your class. If you intend to give seat work either before the recitation or after it, prepare the material for distribution before the session.

The success of the recitation will depend largely on the teacher's preparation. If you neglect your work, the pupils will neglect theirs.

(*b*) *By the Class.* — Do not ask your pupils to recite on the lessons in the book without giving them time for preparation. Young pupils study best when a certain period each day is given to the preparation of a certain lesson. If the lesson has been clearly assigned, the pupils should be expected to prepare it without help from the teacher or from each other.

Above all, insist that each pupil be honest and independent in his preparation of every lesson, and that the papers he brings to class be neatly written and be the result of his own best efforts.

3. The Recitation. — Do not begin the recitation until you have

the undivided attention of every member of your class. It is often helpful to give at the beginning of a recitation a short, rapid, oral review of the preceding lesson.

Always state your question before you name the pupil who is to answer it. This makes it necessary for the whole class to think about the question and its answer.

The pupils should not write any work which can be done orally, or read from papers or slates the answers to the questions marked "oral" in the text.

Be sure that the pupils understand the language of a problem before expecting them to get the number ideas.

If the pupils do not seem to have mastered a principle when the problems involving it have all been solved, give other examples and problems, both oral and written, of a similar kind, taking care to keep the language simple and the conditions clearly stated. Make your problems about the things in which the pupils are interested.

If the pupils answer in concert, the slow ones will depend on those who think quickly. It is usually better to have one pupil at a time stand to recite. In rapid drill work, such as that given with the circles on page 60, it might be well to have the class stand and the pupils recite singly, as suggested in the footnotes.

The drills should not be neglected. Make them short, rapid, and frequent. Keep a circle on the board most of the time, changing the numbers around and within it every day and using it for drill in all the processes. A few minutes a day outside of the regular recitation period might be given to this.

II. THE MATERIALS. — For the work in **Part I**, the teacher must have on the table during the recitation a collection of small objects, such as pebbles, nuts, seeds, blocks, etc.; also a box of two or three hundred sticks of uniform size, an inch or more in length, for use in illustrating number combinations, as suggested in the lessons and footnotes. Any familiar objects in the schoolroom or outside may be used by both teacher and pupils in supplementary oral work.

The pictures are expected to help the pupils in solving the problems given and in making others.

For the work in weights and measures, there should be on the teacher's desk the units of weight and measure that are to be studied by the class, and the pupils should be given much practice in actual weighing and measuring.

PRIMARY ARITHMETIC

PART I

One Two

One Two

One Two

1 2

1 2

1 2

One and one are . . . .

1 and 1 are . . . .

Before beginning each lesson, teach the names and the printed words for objects in the lesson which the pupils do not know. Have the pupils use orally, "I see one cup," etc. Use "I see" with objects in the room. Count five, using objects which they can handle, such as books, pencils, sticks, pebbles, etc. Do not allow the pupils to give the answer "two" when it should be "two cups" or "two leaves." For seat work see page 127.

One and one are . . . .

1 and 1 are . . . .

1 and 1 are . . . .

Three 3

I see 3

I see . . .

Two and one are . . . .

Two eggs and one egg are three eggs.

2 and 1 are . . . .

2 and 1 are . . . .

1 and 2 are . . . .

One and two are . . . .

1 tree and 2 trees are 3 trees.

1 and 2 are . . . .

One and . . . are two

1 fan and . . . are 2 fans.

1 and . . . are 2.

2 and . . . are 3

Two cups and . . . are three cups.

and . . . are

2 and . . . are 3.

1 and . . . are 3

1 hat and . . . are 3 hats.

1 and . . . are 3.

I had three mangos.

I gave Paz one mango.

Now I have . . . mangos.

One and one and one are . . . .

1 and 1 and 1 are . . . .

Have the pupils place sticks to illustrate the combinations learned. Fill the blank in the first line with "one fan." Let pupils use "I have" and "You have" with objects they are handling.

I see four birds.

Count four boys. Give me 4 sticks.

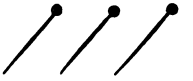
A dog has 4 feet.

Three jars and one jar are . . . .

3 sticks and 1 stick are . . . .

3 cups and 1 cup are . . . .

3 and 1 are . . . .

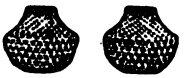
One and three  are . . . .

1 egg and 3 eggs are . . . .

. . . and . . . are . . . .

1 and 3 are . . . .

Ask the pupils to find groups of 2, 3, and 4 objects, and make problems about them. Let pupils count 10 objects. For seat work see page 127.

2 and 2  are . . . .

2 mangos and 2 mangos are . . . .

. . . and . . . are . . . .

2 and 2 are . . . .

There are . . . twos in four.

A bird has . . . feet.

Two birds have . . . feet.

A bird has . . . eyes.

Two birds have . . . eyes.

1 and 1 and 1 and 1 are . . . .

There are . . . ones in four.

1 and . . . are 4

1 bird and . . . are 4 birds.

. . . and . . . are

3 eggs and . . . are 4 eggs.

1 and . . . are 4. 3 and . . . are 4.

Give many other oral problems about objects familiar to the pupils. Pupils continue counting, and the use of "I see," "I have," and "You have," in connection with objects. For seat work see page 127.

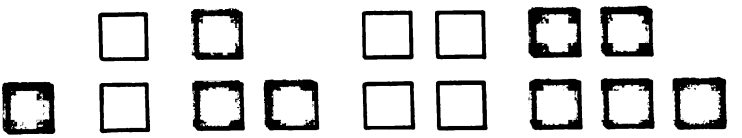
2 / / and . . . are 4 / / / /

2 eyes and . . . are 4 eyes.

2 and . . . are 4.

I had 4 books. I gave Juan 2 books.

Now I have . . . books.



1 and 1 are . . . .

2 and . . . are 3.

3 and 1 are . . . .

1 and 2 are . . . .

2 and . . . are 4.

1 and . . . are 3.

3 and . . . are 4.

1 and . . . are 3.

2 and 2 are . . . .

There are . . . twos in four.

Pupils draw simple objects, such as leaves, fans, sticks, etc., to illustrate the abstract examples on this page.

1	2	3	4	5
one	two	three	four	five

Here are five bells.

There are 5 fingers on one hand.

I see . . . balls.

and are . . . .

4 bells and 1 bell are . . . .

4 and 1 are . . . .

and are . . . .

1 dog and 4 dogs are . . . .

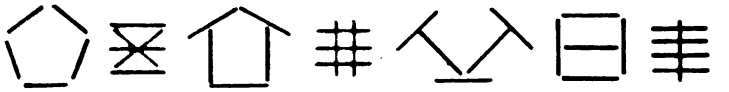
1 and 4 are . . . .

3 and 2 are . . . .

3 mangos and 2 mangos are . . . .

3 and 2 are . . . .

Drill on pronunciation of number names. For seat work see page 127.



4 boys and . . . are 5 boys.

4 centavos and . . . are 5 centavos.

1 cup and . . . cups are 5 cups.

4 and . . . are 5. 1 and . . . are 5.

2 // and . . . are 5 /////

2 chicos and . . . are 5 chicos.

3 bells and . . . are 5 bells.

3 and . . . are 5. 2 and . . . are 5.

Here are 5 chicos.

If Leon eats 2 chicos, how many chicos will be left?

There will be . . . chicos left.

Juan had 5 pencils. He gave José 3 pencils. Juan now has . . . pencils.

Notice that each design at the top of the page is made of 5 sticks. Give each pupil a handful of sticks. Let the pupils lay the sticks in the designs given, and make new designs, using 5 sticks for each.

I see . . . birds.

There is a nest in the tree.

How many eggs do you see?

I see . . . eggs.

A bird has . . . feet.

2 birds have . . . feet.

If one bird flies away, how many birds are left?

4 birds and . . . are 5 birds.

2 eggs and . . . are 5 eggs.

How many eyes have 2 birds?

Juan had 3 centavos. Leon gave him 1 centavo. Juan now has . . . centavos.

2 . . . and 3 . . . are . . . .

1 . . . and 4 . . . are . . . .

2 . . . and 2 . . . are . . . .

For seat work see page 127.

I see six pots and six candles.

Take 6 steps. Draw 6 squares.

Hold up 6 fingers. Count six.

Draw 5 lines. Draw 1 line. How many lines do you see?

5 fans and 1 fan are . . . .

1 pot and 5 pots are . . . .

5 and 1 are . . . . 1 and 5 are . . . .

4 leaves and 2 leaves are . . . .

4 bells and 2 bells are . . . .

2 candles and 4 candles are . . . .

2 birds and 4 birds are . . . .

4 and 2 are . . . . 2 and 4 are . . .

I see 2 plates. On each plate there are . . . chicos. On the two plates there are . . . chicos.

3 plates and 3 plates are . . . .

There are . . . threes in six.

2 times 3 are . . . .

2 birds and 2 birds and 2 birds are . . . .

A boy has . . . eyes. 2 boys have . . . eyes.

There are . . . twos in six.

Three times 2 are . . . .

Leon had 6 bananas. He ate 1 banana and had . . . bananas left.

I had 6 chicos in a basket. I put 2 of them on a plate. How many chicos were left in the basket?

Take 6 sticks in your right hand. Lay 3 of them on your desk. How many sticks are now in your hand?

Pupils find groups of 5 and 6 objects, and make problems about them.

4 leaves and . . . are 6 leaves.

4 hats and . . . are 6 hats.

5 candles and . . . are 6 candles.

5 and . . . are 6. 2 and . . . are 6.

1 and . . . are 6. 4 and . . . are 6.

3 and . . . are 6. 2 and . . . are 4.

\+ and = are

2+1=	1+2+1=	3+?=4
3+3=	3+1+2=	2+?=5
5+1=	2+2+2=	4+?=6
2+3=	2+3+1=	2+?=4
4+2=	2 times 1=	1+?=3
1+3=	2 times 2=	5+?=6
2+2=	2 times 3=	3+?=6

There are . . . twos in six.

Let the pupils lay with sticks the designs given above. Count 20. Explain the signs + and =. For seat work see page 128.

1 frog and 6 frogs are . . . .
6 eggs and 1 egg are . . . .
There are 7 days in a week.
There are 5 school days in 1 week.
5 days and 2 days are . . . .

Here are 5 green squares and 2 black squares. Here are . . . squares.

I had 2 bananas. Luz gave me 5 bananas. Now I have . . . bananas.

4 birds and 3 birds are . . . .
3 trees and 4 trees are . . . .

6+1=	5+1=	3+3=
3+2=	2+5=	5+2=
4+3=	1+3=	3+4=

I have 7 shells. If I give you 1 shell, I shall have . . . shells.

6 candles and . . . are 7 candles.

and . . . are

5 frogs and . . . are 7 frogs.

In 1 week there are . . . days.

How many school days are in 1 week?

Paz had 7 candles. She burned 3 candles. Paz now has . . . candles.

3 weeks and . . . are 7 weeks.

4 days and . . . are 7 days.

I see . . . eggs in a basket.

If I take out 3 eggs, there will be . . . eggs left in the basket.

6+?=7	4+?=7	5+?=7
2+?=7	1+?=7	3+?=7

3+1=	3+3=	3+?=7
2+?=6	2+?=4	1+?=4
5+?=7	6+?=7	3+?=6
4+3=	1+4=	2+?=3

There are . . . twos in four.

There are . . . twos in six.

There are . . . threes in six.

I have 3 pencils in each hand. How many pencils have I?

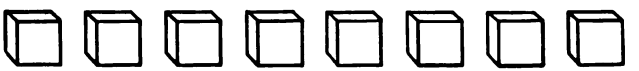
I saw 3 nests. In each nest there were 2 eggs. How many eggs did I see?

I see 5 red fans and 2 black fans. I see . . . fans.

4 hats and 3 hats are how many hats?

For seat work see page 128.

1 □	one	|
2 □□	two	||
3 □□ □	three	|||
4 □□ □□	four	||||
5 □□ □□ □	five	𝍸
6 □□ □□ □□	six	𝍸|
7 □□ □□ □□ □	seven	𝍸||
8 □□ □□ □□ □□	eight	𝍸|||
9 □□ □□ □□ □□ □	nine	𝍸||||
10 □□ □□ □□ □□ □□	ten	𝍸𝍸



boxes.

shells.

pins.

Bring to school 8 leaves, 9 paper squares, 10 paper circles.

Take 8 steps. Hold up 10 fingers.

7 bees and 1 bee are . . . .
7 balls and 1 ball are . . . .
1 boy and 7 boys are . . . .

7+1= 1+7=

8 birds and 1 bird are . . . .
8 jars and 1 jar are . . . .
1 basket and 8 baskets are . . . .

8+1= 1+8=

9 trees and 1 tree are . . . .
9 pots and 1 pot are . . . .
1 girl and 9 girls are . . . .

9+1= 1+9=

eight	nine	ten
8	9	10

7 mangos and . . . are 8 mangos.

1 shell and . . . are 8 shells.

$7+?=8$ $1+?=8$

8 frogs and . . . are 9 frogs.

1 tree and . . . are 9 trees.

$8+?=9$ $1+?=9$

9 pins and . . . are 10 pins.

1 dog and . . . are 10 dogs.

$9+?=10$ $1+?=10$

. . . pens and . . . pens are . . . .

2 bees and 6 bees are . . . .

$6+2=$ $2+6=$

. . . shells and . . . shells are . . . .

2 plates and 7 plates are . . . .

$7+2=$ $2+7=$

For seat work see page 128.

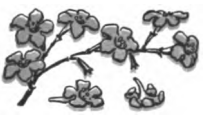
8 cats and 2 cats are . . . .

2 buttons and 8 buttons are . . . .

2 boxes and 8 boxes are . . . .

$8+2=$ $2+8=$

How many horses are 7 horses and 2 horses?



Luz had 8 flowers. She gave Maria 6 flowers. Luz had . . . flowers left.

2 bananas and . . . are 8 bananas.

$6+?=8$ $2+?=8$

There were 9 birds in a tree. Two flew away. How many birds were left in the tree?

2 chicos and . . . are 9 chicos.

$7+?=9$ $2+?=9$

Let the pupils make problems about the cats, flowers, and birds.

Draw 10 circles. Cross out 2 circles. How many circles are left?

8 pens and . . . are 10 pens.

2 cats and . . . are 10 cats.

$8+?=10$ $2+?=10$

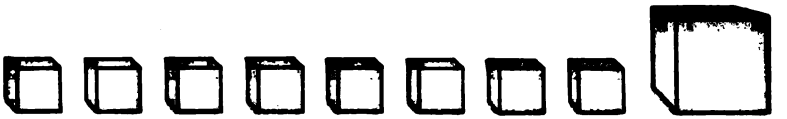
I have 10 beans. If I plant 8 beans, I shall have . . . beans left.

José has 6 small bananas and 2 large bananas. He has . . . bananas.

Add:

1	1	1	1	1	2	2	2	2
5	6	7	8	9	5	6	7	8
6								

2	4	3	2	1	5	2	1	2
3	2	3	2	3	2	4	4	5



Here are 8 small boxes and 1 large box.

Each small box holds 1 chupa.

The large box holds 1 ganta.

There are 8 chupas in 1 ganta.

I have 1 ganta of rice. I pour it into the large box. It fills the large box.

I pour the rice from the large box into the small boxes. It fills the small boxes.

1 ganta of rice is . . . chupas of rice.

This pot holds 4 chupas.

This cup holds 2 chupas.

How many times can I fill the pot from 1 ganta of rice?

How many times can I fill the cup from 1 ganta of rice?

Have chupa and ganta measures for the pupils to fill with sand, water, etc. Give other problems, using these measures. See seat work page 128.

4 chupas and 4 chupas are . . . .

There are . . . fours in eight.

2 times 4 are . . . .

2+2+2+2=

There are . . . twos in eight.

4 times 2 are . . . .

If 1 paper costs 4 centavos, 2 papers will cost . . . centavos.

If 1 chupa of milk costs 2 centavos, 4 chupas will cost . . . centavos.

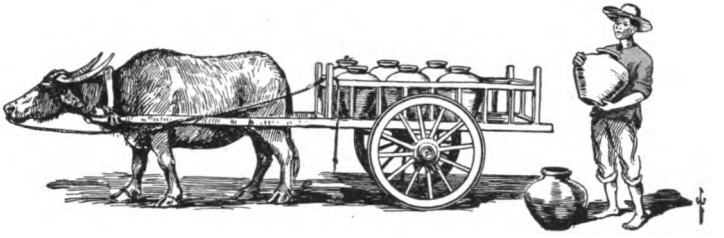
How many hands have 4 boys?

How many feet have 2 dogs?

How many eyes have 4 horses?

Count by 2's (twos) from 2 to 8.

Count by 2's from 1 to 9.



I see a cart.

The cart has . . . wheels.

Two carts have . . . wheels.

Four carts have . . . wheels.

4 times 2 wheels are . . . .

There are . . . jars on the cart, and the man has . . . more jars.

6 jars and 2 jars are . . . .

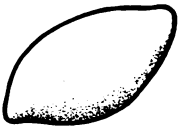
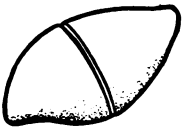
Each jar holds 3 gantas. 2 jars hold . . . gantas.

A carabao has . . . feet and . . . horns.

2 carabaos have . . . feet.

4 carabaos have . . . horns.

Give other problems about the picture. For seat work see page 128.

A lemon has two halves.

A square has two halves.

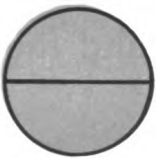
One half of the square is white.

One half of the square is brown.

This is $\frac{1}{2}$ of a circle.

Show me $\frac{1}{2}$ of your pencil.

Fold your handkerchief to show $\frac{1}{2}$ of it.



A circle has $\frac{2}{2}$.

$$\frac{1}{2}+\frac{1}{2}=\frac{2}{2}$$

This basket holds $\frac{1}{2}$ of one ganta. How many baskets like this will hold one ganta?

In 1 papaya there are . . . halves.

In 1 there are how many halves?

$$\frac{1}{2}+\frac{1}{2}=1 \qquad \frac{2}{2}=1$$

At the beginning of this lesson cut an orange, papaya, or lemon, into halves, taking care that they shall be exactly equal. Have the pupils cut squares and circles of paper into halves.

In one circle there are four fourths.

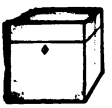
This is $\frac{1}{4}$ of a circle.

In a line there are $\frac{4}{4}$.

Fold your handkerchief to show $\frac{1}{4}$ of it.

In one lemon there are . . . fourths.

$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{4}{4}$ $\frac{4}{4}=1$



This box holds $\frac{1}{4}$ of 1 ganta.

How many boxes like this will hold 1 ganta?

Draw a line as long as your pencil.

Draw a line $\frac{1}{2}$ as long as your pencil.

Draw a line $\frac{1}{4}$ as long as your pencil.

Cover $\frac{1}{2}$ of your slate with your book.

Cover $\frac{1}{4}$ of this page with paper.

Draw a square and divide it into fourths.

Have the pupils show fourths by folding and cutting squares, circles, etc. See note on page 32. For seat work see page 128.

One half of two flowers is one flower.

½ of 2 books is . . . . ½ of 2 is . . . .

I see 2 birds sitting and 2 birds flying.

2 times 2 birds are . . . .

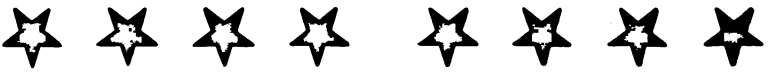
½ of 4 birds is . . . .

2 times 2 are . . . . ½ of 4 is . . . .

Here are . . . white pigs and . . . black pigs. 2 times 3 pigs are . . . .

½ of 6 pigs is . . . . ½ of 6 is . . . .

Juana had 6 pens. She gave me ½ of the pens. Juana now has . . . pens.



½ of 8 stars is how many stars?

Take 4 books in each hand.

½ of 8 books is . . . . ½ of 8 is . . . .

I see . . . spoons. 5 + 5 =

How many fingers have you on one hand? ½ of 10 fingers is . . . .

There are . . . 5's in ten. ½ of 10 is . . . .

There were 10 eggs in a nest. I took out ½ of the eggs. How many did I take out?

There are . . . ones in four.

¼ of 4 centavos is . . . .

4 times 1 are . . . . ¼ of 4 is . . . .

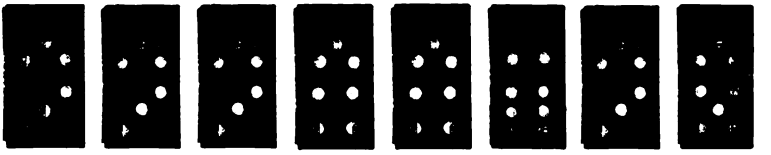
I see 4 boys. Each boy has 2 centavos. All the boys have . . . centavos.

4 times 2 are . . . . ¼ of 8 is . . . .

In 1 ganta there are . . . chupas.

In ¼ of 1 ganta there are . . . chupas.

Give many other problems, using ½ of 2, 4, 6, 8, and 10; ¼ of 4 and 8.



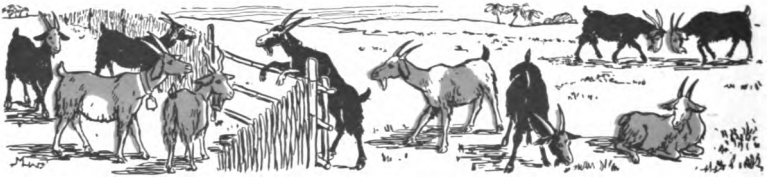
I have 5 small flags and 3 large flags. I have . . . flags.

In one week there are . . . days. In 1 week and 3 days there are . . . days.

6 pesos and 3 pesos are . . . .

Luz had 5 centavos. I gave her 4 centavos. She now has . . . centavos.

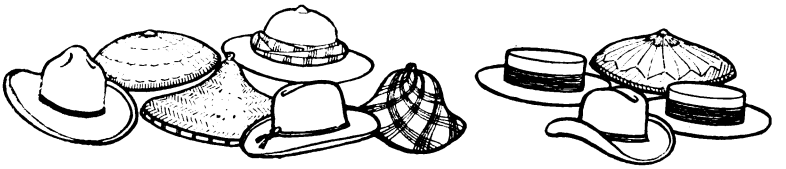
Draw 6 small circles and 3 large circles. How many circles have you drawn ?



Luis has 6 black goats and 4 brown goats. How many goats has he ?

Pedro has 7 oranges. I give him 3 oranges. He now has . . . oranges.

For seat work see page 128.



There are . . . hats in this picture.

6 hats and . . . are 10 hats.

There are 10 girls in a class. Three girls go home. How many girls are left in the class?

I had 8 rats in a trap. Three rats got out. How many rats are left in the trap?

There were 9 plates on a table. Maria took 6 of them away. How many plates were left on the table?

Subtract:

8	6	9	7	5	10	9	7	6
7	2	3	4	2	4	4	2	3
1	4							

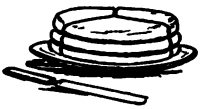
For seat work see page 128.

In a circle there are three thirds.

$\frac{1}{3}+\frac{1}{3}+\frac{1}{3}=\frac{3}{3}$.

A line has . . . thirds.

A chico has $\frac{3}{3}$.



This cake has . . . thirds. If I eat $\frac{1}{3}$ of the cake, how many thirds will be left?

What part of this square is blue?

There are . . . ones in three.
3 times . . . are 3. $\frac{1}{3}$ of 3 is . . . .
Count by 2's to 6.
3 times . . . are 6. $\frac{1}{3}$ of 6 is . . . .
Count by 3's to 9.
3 times . . . are 9. $\frac{1}{3}$ of 9 is . . . .

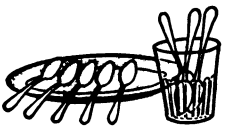
For seat work see page 128.

I see in the picture . . . hen, . . . white chickens, and . . . black chickens. Seven chickens and 3 chickens are . . . .

4 times 2 hens are . . . .

Paz has 3 baskets. In each basket there are 3 mangos. How many mangos has Paz?

Juan had 4 candles. He burned 3 candles. How many candles had he left?



There are . . . spoons on the plate and . . . spoons in the glass. How many spoons do you see?

If I take 2 spoons from the plate and put them into the glass, there will be . . . on the plate and . . . in the glass.

$4+2=$	$5+4=$	$2+?=10$
$\frac{1}{2}$ of $6=$	$4+6=$	$7+?=9$
$7+3=$	$\frac{1}{3}$ of $9=$	$3+?=6$
$3+2=$	$3+6=$	$6+?=8$

Add:

3	4	3	6	2	3	1	4	6
5	3	3	2	5	6	9	5	4

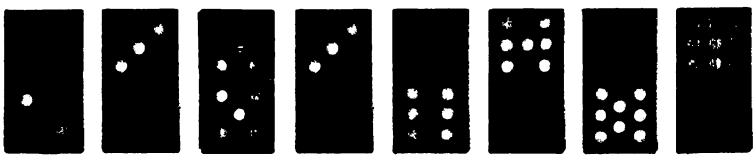
Subtract:

7	8	9	8	10	10	5	6	9
2	4	6	7	3	4	4	3	1

$\frac{1}{2}$ of $8=$ $\frac{1}{3}$ of $6=$ $\frac{1}{4}$ of $4=$ $\frac{1}{4}$ of $8=$

2 times 2 are .... 2 times 4 are ....

2 times 3 are .... 2 times 5 are ....



Have the pupils draw the dominoes, and place in the blank half of each enough dots to make 10.

PART II

NUMBERS TO 100

Reading and writing numbers; dozen; inch, foot, and yard; metric measures; addition; subtraction; multiplication; division.

NUMBERS TO 20

1. Oral.

1 2 3 4 5 6 7 8 9 10

11 eleven 10+ 1=11

12 twelve 10+ 2=12

13 thirteen 10+ 3=13

14 fourteen 10+ 4=14

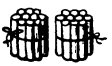
15 fifteen 10+ 5=15

16 sixteen 10+ 6=16

17 seventeen 10+ 7=17

18 eighteen 10+ 8=18

19 nineteen 10+ 9=19

20 twenty  10+10=20

2. Oral.

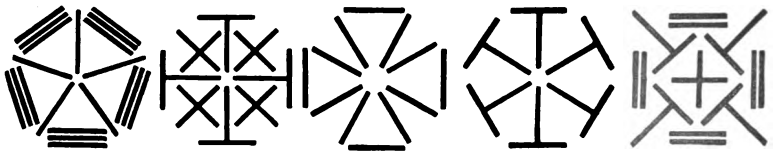
1. Read the following numbers:
12, 14, 17, 15, 13, 10, 18, 11, 9, 16, 20, 19.
2. Count to 20 by 1's, 2's, 4's, and 5's.
3. Take 20 steps. Tap 20 times.

4. ?+1= 9	?+1=13	?+1=17
5. ?+1=10	?+1=14	?+1=18
6. ?+1=11	?+1=15	?+1=19
7. ?+1=12	?+1=16	?+1=20

8. Count by 2's from 1 to 19. 1, 3, 5, 7, etc.
9. Count by 3's from 1 to 19. 1, 4, 7, etc.
10. Write the numbers from 10 to 20.

11. 10+?=11	10+?=16
12. 10+?=12	10+?=17
13. 10+?=13	10+?=18
14. 10+?=14	10+?=19
15. 10+?=15	10+?=20

16. How many sticks are used in each picture?



Drill on the pronunciation, spelling, reading, and writing of numbers from 1 to 20. Have the pupils count 12 girls, 16 books, 19 words, etc. Let them lay designs with sticks, each containing 12, 13, 14, etc. Count 50.

3. Oral.

Pedro and his sister Paula have come to get the chicos.

1. How many chicos do you see on the tree? How many are there in the basket? How many are there on the ground?

2. If Pedro takes 3 chicos from the tree and puts them into the basket, and Paula puts in the chicos which are on the ground, how many will there be in the basket then?

3. Pedro wants to take 7 chicos to his mother and 4 to his little brother. How many chicos will he need?

4. 3 chicos and 8 chicos are how many?

5. Paula had 11 chicos. She ate 4 of them. How many were left?

6. If one centavo will buy 2 chicos, five centavos will buy how many?

Let the pupils make other problems about the chicos, such as: "At 2 centavos each, what are the chicos in the basket worth?" "How many must Paula put into the basket to make 11?" "When Pedro picks 3, how many will be left on the tree?"

7. I bought 11 candles. I burned 4 of them and gave away 2. How many were left?

8. At 2 centavos each, how many eggs can I buy with 11 centavos? How many centavos will be left?

9. A fisherman caught 6 small fish and 4 large fish. If he sold 5 of them, how many were left?

10. Pedro has 3 sisters, Juan has 4, and Leon has 2. How many sisters have they all?

11. Luz is 5 years old. Juana is twice as old and 1 year more. How old is Juana?

12. If I pour $\frac{1}{2}$ of the water from a jar holding 11 liters, how many liters will be left?

13. There were 11 crabs in a basket. I took out 6 of them. How many were left?

14. Carmen gave 4 flowers to Paz, 5 to Luz, and had 2 left. How many had she at first?

15.	$10+1=$	$7+2=$	$7+?=11$	$\frac{1}{2}$ of $4=$
16.	$8+1=$	$7+4=$	$9+?=11$	$\frac{1}{3}$ of $3=$
17.	$5+6=$	$9+1=$	$2+?=11$	$\frac{1}{2}$ of $6=$
18.	$2+9=$	$4+4=$	$10+?=11$	$\frac{1}{3}$ of $6=$
19.	$4+7=$	$7+3=$	$8+?=11$	$\frac{1}{2}$ of $8=$
20.	$8+3=$	$9+2=$	$5+?=11$	$\frac{1}{3}$ of $9=$

4. Oral.

1. How many mice are there in the picture?

2. 9 mice and . . . mice are 12 mice.

3. If two mice run away, how many will be left?

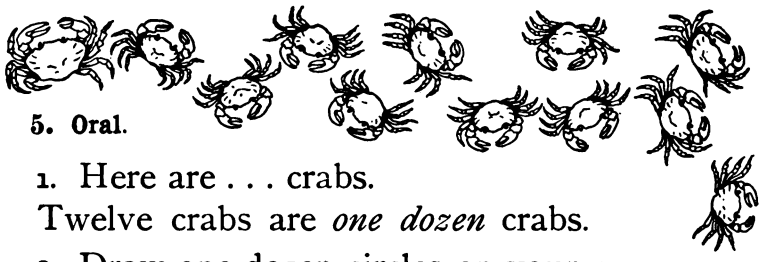
4. Luis bought 12 bananas at the market. He gave 3 to Leon and 3 to Carmen. How many did he give away? How many were left?

5. There are 8 gantas of rice in the large basket, and 4 gantas in the small basket. How many gantas of rice are there in both baskets?

Add:

6. 2	7. 7	8. 3	9. 4	10. 6	11. 5	12. 2
8	5	9	8	6	6	10
13. 4	14. 5	15. 5	16. 2	17. 4	18. 3	19. 9
6	3	5	7	4	7	3

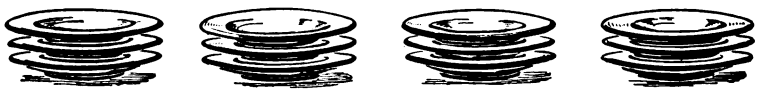
Let the pupils make other problems about the mice; such as, "If the white mice run away, how many will be left?" "If $\frac{1}{3}$ of the black mice are caught, how many will be left?"



5. Oral.

1. Here are . . . crabs.
   Twelve crabs are *one dozen* crabs.
2. Draw one dozen circles on your paper.
3. How many mice make a dozen?
4. How many crabs are there in a half dozen?

5. I see . . . plates. On each plate there are . . . mangos. On all the plates there are . . . mangos.
6. 3 times 4 mangos are . . . mangos.
7. $\frac{1}{3}$ of 12 is . . . There are . . . 4's in 12.



8. How many plates are there in these 4 piles?
9. There are . . . 3's in 12.
10. One fourth of 12 plates is . . . plates.
11. 4 times 3 are . . . $\frac{1}{4}$ of 12 is . . .

Let the pupils show $\frac{1}{2}$ of 12, $\frac{1}{3}$ of 12, and $\frac{1}{4}$ of 12 with little sticks, seeds, or shells. The teacher should always take time to look over such seat work.

6. Oral.

Add:

1.	2.	3.	4.	5.	6.	7.
2	5	4	7	5	2	2
3	2	4	3	4	6	1
4	3	4	2	1	4	9

8.	9.	10.	11.	12.	13.	14.
1	2	2	6	3	2	1
3	2	4	2	4	4	7
2	3	3	2	3	3	3
5	4	2	2	1	3	1

Subtract:

15.	16.	17.	18.	19.	20.	21.
8	12	11	12	10	12	11
3	4	7	6	8	3	3

22.	23.	24.	25.	26.	27.	28.
9	10	11	8	12	12	12
4	3	5	5	5	8	10

29. $\frac{1}{2}$ of 10 = $\frac{1}{2}$ of 12 = $\frac{1}{3}$ of 12 = $\frac{1}{4}$ of 12 =

30. $\frac{1}{4}$ of 8 = $\frac{1}{3}$ of 9 = $\frac{1}{2}$ of 8 = $\frac{1}{3}$ of 6 =

31. How many fours are there in 12?

32. How many twos are there in 10?

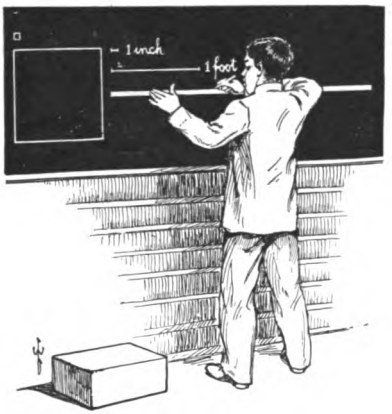
33. How many threes are there in 12?

34. How many twos are there in 12?

35. How many fives are there in 10?

Let the pupils copy 1–14 and write the sums.

INCH, FOOT, AND YARD



7. Oral.

If it seems practical to teach these units of measure at this time, the teacher should have each pupil make a foot rule. Since the table given applies to either the English or the Spanish units the problems also may be used for either system. The teacher must choose between the Spanish vara and the English yard.

Have a few pupils make yard or vara sticks for the use of the class.

Have the pupils measure many familiar objects at home and at school.

This boy has drawn a line 1 *inch* long, and a line 1 *foot* long. He is now drawing a line 1 *yard* long.

12 inches = 1 foot
3 feet = 1 yard

1. How many inches long is your book? How many inches wide is it?
2. Measure one edge of your handkerchief.
3. Measure the top of the table. How many feet long is it? How wide is it?
4. How wide is your desk? How high is it?
5. How many yards long is the schoolroom?
6. Measure the distance from the corner of the schoolhouse to the nearest tree.

8. Oral.

1. Count the stripes in the flag.

2. How many red stripes are there? How many white stripes?

3. 7 stripes and 6 stripes are how many stripes?

4. I have 4 large flags and 7 small flags. I have . . . flags.

5. At 6 centavos each, what will 2 small flags cost?

6. I had 13 centavos. If I paid 10 centavos for a cake, how many centavos were left?

7. How many days in 1 week and 5 days?

8. In 1 foot and 1 inch there are . . . inches.

9. Manuel had 13 chicos. If he gave away a dozen chicos, how many were left?

10. Count by 2's from 1 to 13.

11. Count by 3's from 1 to 13.

12.	10+ 3=	3+ 9=	4+?=13	5+?=13
13.	7+ 6=	9+ 4=	7+?=13	10+?=13
14.	2+11=	6+ 6=	3+?=13	8+?=13
15.	5+ 7=	7+ 6=	12+?=13	2+?=13
16.	8+ 5=	1+12=	6+?=13	9+?=13

Let the pupils copy examples 12–16 and supply the answers.

9. Oral.

1. Count the ants in the picture.

2. How many times can you count 7 ants?

3. 2 times 7 are . . . $\frac{1}{2}$ of 14 is . . .

4. Esteban is 14 years old and his sister is 2 years younger. How old is his sister?

5. How many days are there in two weeks?

6. There are 8 boys and 6 girls in one row. How many children are there in the row?

7. Count by 2's to 14. Show with sticks how many 2's there are in 14.

8. If 1 orange costs 2 centavos, how many oranges can you buy with 14 centavos?

9. Isabel had 9 yards of white ribbon and 5 yards of red ribbon. How many yards of ribbon had she?

10. What will half a dozen lead pencils cost at 2 centavos each?

11. Write 2 times 1 are 2, 2 times 2 are 4, and so on to 2 times 7.

12. One foot is what part of one yard?

Add:

13. 3	14. 6	15. 10	16. 5	17. 5	18. 8	19 7
9	7	4	6	9	6	7
20. 4	21. 5	22. 6	23. 3	24. 8	25. 3	26. 3
7	8	6	7	2	4	10

Subtract:

27. 9	28. 8	29. 10	30. 12	31. 11	32. 13	33. 10
4	3	2	7	4	8	6
34. 14	35. 13	36. 14	37. 13	38. 12	39. 14	
4	9	8	3	5	9	

10. Oral.

1. How many rows of cubes do you see?

2. How many cubes are there in each row?

3. How many cubes are there in all the rows?

4. 3 times 5 cubes are ... cubes. $\frac{1}{3}$ of 15 is ...

5. There are ... fives in 15.

6. In 1 yard there are ... feet. In 5 yards there are ... feet. 5 times 3 are ...

7. There are . . . trees in the picture.

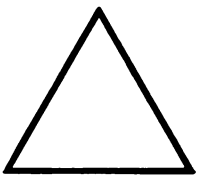
8. How many palm trees are there?

9. If 3 trees are cut down, how many trees will be left?

10. I saw 7 monkeys in one tree, 5 in another, and 3 in a third. How many monkeys did I see?

11. Paz took 15 eggs to market and sold $\frac{1}{3}$ of them. How many eggs did she sell?

This is a *triangle.*



12. A triangle has . . . sides. 5 triangles have . . . sides.

13. How many triangles can you make with 12 sticks?

14. Count by 3's to 15. Count by 5's to 15.

15.	3+10=	9+ 6=	13+?=15	9+?=15
16.	7+ 7=	8+ 7=	10+?=15	2+?=15
17.	5+10=	4+11=	12+?=15	4+?=15
18.	7+ 6=	3+12=	6+?=15	9+?=15
19.	11+ 3=	8+ 5=	7+?=15	8+?=15

11. Oral.

1. Fifteen and one are . . .

2. Luz and Josefa have 16 centavos. Luz has 14 centavos, and Josefa has . . . centavos.

3. One dozen and four are how many?

4. Count by 2's to 16.

5. There are . . . twos in sixteen.

6. 8 carts have how many wheels?

7. How many wings have 8 birds?

8. Draw 4 squares. How many sides have 4 squares? How many corners have 4 squares?

9. There are . . . 4's in 16. $\frac{1}{4}$ of 16 is . . .

10. How many times can you count 8 butterflies in the picture?

11. $\frac{1}{2}$ of 16 butterflies is . . .

12. There are . . . eights in sixteen.

13. I see 2 houses. In each house there are 8 windows. How many windows in both?

Have the pupils make problems about the butterflies. Ask them to lay sticks to show how many 2's, 4's, and 8's there are in 16.

12. Oral.

1.	$15+1=$	$9+?=15$	$5+11=$
2.	$10+?=16$	$8+7=$	$12+?=16$
3.	$9+7=$	$4+9=$	$13+3=$
4.	$6+7=$	$7+9=$	$8+?=16$
5.	$3+12=$	$10+?=14$	$2+11=$

Add:

6.	7.	8.	9.	10.	11.	12.	13.	
2	6	8	4	7	2	9	3	
8	6	1	3	3	10	4	2	
4	4	6	9	5	3	2	10	

Subtract:

14.	15.	16.	16.	17.	18.	19.		
15	16	16	16	16	15	16		
9	8	7	3	8	14			

This sign ($\times$) is read *times.*

20.	$2\times1=$	$2\times5=$	$3\times1=$	$\frac{1}{2}$ of $8=$
21.	$2\times2=$	$2\times6=$	$3\times2=$	$\frac{1}{3}$ of $9=$
22.	$2\times3=$	$2\times7=$	$3\times3=$	$\frac{1}{4}$ of $12=$
23.	$2\times4=$	$2\times8=$	$3\times4=$	$\frac{1}{3}$ of $15=$
24.	$4\times1=$	$4\times3=$	$3\times5=$	$\frac{1}{2}$ of $16=$
25.	$4\times2=$	$4\times4=$	$5\times2=$	$\frac{1}{2}$ of $12=$
26.	$6\times2=$	$7\times2=$	$5\times3=$	$\frac{1}{3}$ of $12=$

13. Oral.

1. Mariano and José planted a garden. Each boy planted 2 rows of maize, 3 rows of beans, and 3 rows of tomatoes. How many rows did they both plant?

2. If 3 tomato plants cost 5 centavos, how many plants could the boys buy with 15 centavos?

3. Mariano made an onion bed 2 yards long and 1 yard wide. How many steps $\frac{1}{2}$ yard long did he take in walking around it?

4. José worked in the garden 2 hours each day on Monday, Tuesday, and Wednesday, and 3 hours each day on Thursday, Friday, and Saturday. How many hours did he work in that week?

5. José planted $2\frac{1}{2}$ rows of radishes. It took a 6-centavo package of seed to plant each row. What did he pay for radish seed?

6. At one end of the garden Mariano set out 15 rose bushes, but 4 of them did not grow. How many of them grew?

7. The boys spent 3 pesos on their garden and sold the vegetables for $10\frac{1}{2}$ pesos. What was their gain?

14. Oral.

1. Sixteen and one are how many?

2. There are 10 trees in one row and 7 trees in another row. In both rows there are . . . trees.

3. One dozen and five eggs are how many eggs?

4. In 2 weeks and 3 days there are . . . days.

5. Maria is 13 years old, and her sister is 4 years older. How old is her sister?

6. One foot and . . . inches are 17 inches.

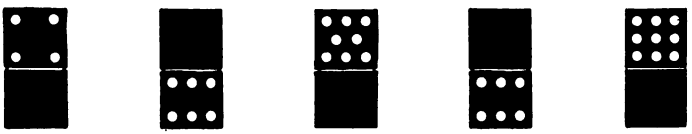
7. I had 17 books and sold 8 of them. I then had . . . books.

8. Mr. Asico set out 2 rows of banana plants, putting 8 plants in each row. How many plants did he set out?

Add:

9.	10.	11.	12.	13.	14.	15.
8	10	5	6	4	12	2
9	7	8	11	13	5	15

16. What is $\frac{1}{2}$ of 16? $\frac{1}{4}$ of 16? $\frac{1}{3}$ of 15?



Let the pupils copy the dominoes, filling in the blank half of each with enough dots to make 17 in each domino.

15. Oral.

Felisa and her mother have been to the market to buy some fruit.

1. Felisa's mother has ... bananas and ... mangos in her basket.

2. At 3 centavos each, what did she pay for the mangos?

3. At 10 centavos a dozen, what did the bananas cost?

4. Felisa bought 3 oranges at 2 centavos each, and 2 pieces of sugar-cane at 1 centavo each. How much did she spend?

5. If Felisa had 18 centavos when she went to market, how much has she now?

6. Place 18 sticks in 2 equal piles. How many sticks are in each pile? $\frac{1}{2}$ of 18 is ...

7. What will 2 handkerchiefs cost at 9 centavos each? $2 \times 9 =$ 9 is ... of 18.

8. 6 triangles have how many sides?

9. A dozen and a half eggs are ... eggs.

Let the pupils write the answers to these problems in simple statements; for example,

2. "She paid 18 centavos for the mangos." 3. "The bananas cost 10 centavos."

10.	$9+\ 9=$	$15+?=18$	$8+\ 7=$	$\frac{1}{2}$ of $18=$
11.	$3+14=$	$17+?=18$	$16+\ 2=$	$\frac{1}{3}$ of $9=$
12.	$10+\ 8=$	$10+?=18$	$11+\ 7=$	$\frac{1}{3}$ of $18=$
13.	$13+\ 5=$	$11+?=18$	$15+\ 3=$	$2\times 9=$
14.	$12+\ 6=$	$16+?=18$	$12+\ 4=$	$3\times 6=$
15.	$\frac{1}{3}+\ \frac{1}{3}=$	$\frac{1}{2}+?=\frac{2}{2}$	$\frac{1}{4}+\ \frac{2}{4}=$	$3\times\frac{1}{3}=$

16. Oral.

1. Count 19. Eighteen and . . . are nineteen.

2. Leon had 17 centavos and he found 2 centavos. How many centavos had he then?

3. 2 weeks and . . . days are 19 days.

4. I saw 19 little chickens. 13 chickens were eating and the rest were drinking. How many chickens were drinking?

5. Pedro paid 10 centavos for a ball and 9 centavos for a pencil. What did he pay for both?

6. One dozen and five mangos are how many mangos?

7. Take 19 sticks. Make as many 3's as you can. How many 3's have you? How many sticks are left?

8. My brother has 9 centavos and 12 half-centavos. How many 5-centavo pieces can he get for them?

Let the pupils write the answers to these problems in simple statements.

9. How many 3-inch sticks can you make from a 17-inch stick? How long a piece will be left?

10. How many triangles can you make with 18 sticks?

11. 5 children were running, 4 were standing, and 6 were sitting. How many children were there?

Add:

12.	13.	14.	15.	16.	17.
16	5	6	17	8	7
2	14	13	2	8	9

18.	19.	20.	21.	22.	23.	24.
2	4	3	5	2	1	6
4	3	2	2	5	5	2
3	5	7	8	3	3	4
7	5	3	1	7	6	5
3	1	3	3	2	3	2

Subtract:

25.	26.	27.	28.	29.	30.
19	19	19	19	19	19
14	10	7	15	18	12

31.	32.	33.	34.	35.	36.
18	19	19	19	17	19
15	9	11	17	13	5

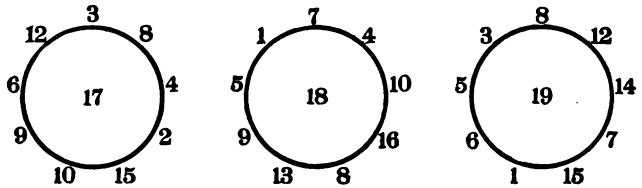
Let the pupils make problems using the numbers in 13, 14, 15, 16, 17, and 18; for example, "Pedro had 16 marbles and Luis had 2. How many marbles had both boys?"

REVIEW OF NUMBERS TO 20

17. Oral.

Add:

1. 2	2. 3	3. 6	4. 8	5. 7	6. 5	7. 4	8. 2
4	3	1	2	10	4	3	3
7	9	6	5	2	5	6	2
6	2	5	1	1	2	1	10



Place the circles on the blackboard for rapid drill work in subtraction. When the teacher points to one of the numbers around a circle, a pupil tells what number added to it will give the number within. For example, when the pointer is on 10 outside the first circle, the pupil thinks "10 and 7 are 17" and answers 7. Let the whole class stand. Pass quickly from one number to another, and from one pupil to another.

9.	$9+10=$	$8+5+?=14$	$\frac{1}{2}$ of $12=$
10.	$3+12=$	$9+6+?=18$	$\frac{1}{3}$ of $15=$
11.	$15+4=$	$3+7+?=16$	$\frac{1}{4}$ of $16=$
12.	$11+6=$	$4+4+?=19$	$\frac{1}{3}$ of $18=$
13.	$5+9=$	$8+2+?=17$	$\frac{1}{2}$ of $14=$
14.	$6+12=$	$3+3+?=18$	$\frac{1}{4}$ of $12=$
15.	$13+5=$	$7+2+?=13$	$\frac{1}{3}$ of $9=$

Have the pupils write the table of 2's to 2×9, 3's to 3×6, 4's to 4×4, 5's to 5×3.

18. Oral.

1. Benito took 18 centavos to the market. He paid 1 centavo each for 11 chicos. How many centavos were left?

2. There were 17 oranges on a tree. 5 fell to the ground. How many oranges were left on the tree?

3. I had 19 bananas. I gave 9 to my sister. I then had . . . bananas.

4. Paula had 9 chicos and ate $\frac{1}{3}$ of them. How many did she eat? How many were left?

5. Maria took 13 roses to school. She gave 4 to Paz and 3 to Carmen. How many roses had she then?

6. I bought 16 chickens. A lizard caught $\frac{1}{4}$ of them. How many did the lizard catch? How many were left?

7. If Leon earned 4 pesos in seven days, how many pesos did he earn in 14 days?

8. Juan has 19 centavos. If he buys 3 oranges at 4 centavos each, how much money will he have left?

9. 5 yards and 2 feet make how many feet?

10. My sister had a ribbon 1 foot and 6 inches long. How many inches of ribbon had she?

11. I carried 15 chicos in a basket. If three little girls took 4 chicos each from the basket, how many chicos did I have left?

12. The wind blew down 11 chico trees and 7 mango trees. How many trees did the wind blow down?

13. How many hours did Luis work in 6 days if he worked 3 hours each day?

14. On one string there are 10 beads and on another 9 beads. How many beads are there on both strings?

15. I had 13 yards of red ribbon and 5 yards of white ribbon. How many yards of ribbon did I have?

16. Juan earned 14 centavos and his father gave him 5 centavos. He then had . . . centavos.

17. At 6 centavos a meter what will two and one half meters of lace cost?

18. Leon had 8 centavos in his pocket and 9 centavos in his hand. How many centavos had he?

19. There were 7 plants in one row and 12 in another row. How many plants were there in both rows?

NUMBERS FROM 20 TO 100

19. Oral.

There are ten sticks in each bundle.

1. How many tens do you see?

2. Place your sticks to make 2 tens.

3. There are . . . tens in twenty (20).

4. Benito and Conrado had 10 centavos each. How many centavos had both boys?

5. A man had 20 gantas of rice and sold $\frac{1}{2}$ of it. How many gantas did he sell?

6. Count by 2's, 4's, 5's, and 10's to 20.

7. Find with your sticks how many 2's, 4's, 5's, and 10's there are in 20.

8. Here are . . . tens.

3 tens are called thirty (30); 4 tens, forty (40); 5 tens, fifty (50); 6 tens, sixty (60); 7 tens, seventy (70); 8 tens, eighty (80); 9 tens, ninety (90); 10 tens, one hundred (100).

9. Count by tens to one hundred.

One *peso* is worth 100 centavos.

10. How many 10-centavo pieces can you get for 1 peso?

11. How many tens are there in 50? In 30? In 80? In 40? In 100? In 60? In 70?

20. Oral.

1. How many tens are there in the first picture? How many ones?

The ones are called *units*.

This number is twenty-one (21).

2. In the second picture there are . . . tens and . . . units.

This number is twenty-two (22).

In twenty-three (23) there are 2 tens and 3 units.

The left-hand figure tells how many tens there are in a number. The right-hand figure tells how many units.

3. With your sticks show how many tens and how many units there are in 25, 26, 27, 28, 29.

4. Read these numbers and tell how many tens and how many units there are in each:

23	38	48	21	32	52	40	18
35	22	33	55	49	45	13	28
42	47	27	41	53	20	31	58
64	75	66	83	78	94	60	99

5. Open your book to pages forty-nine, sixty-seven, eighty-two, thirty-three, seventy-four.

Drill on the spelling and the pronunciation of all new number names. Give numbers orally to be written in figures by the pupils. Count 100.

21. Written.

Write in figures:

1. Thirteen.
2. Twenty-one.
3. Forty.
4. Twelve.
5. Thirty-two.
6. Eighteen.
7. Fifty-two.
8. Seventeen.
9. Twenty-nine.
10. Sixty-six.
11. Thirty-five.
12. Nineteen.
13. Seventy-five.
14. Four.
15. Forty-seven.
16. Sixteen.
17. Eleven.
18. Fifty-eight.
19. Thirty-six.
20. Eighty-eight.
21. Ninety-four.
22. Twenty-three.

Write the number that tells:

23. How many desks there are in the schoolroom.
24. How many shells there are in one window.
25. How many pupils there are in your class.
26. How many years old you are.
27. How many centavos there are in a half-peso.
28. How many words there are on this page.

Write the numbers between:

29. 30 and 50; 70 and 90.

Give other problems like 23, 24, 25, 26, 27, and 28.

METRIC MEASURES — CENTIMETER, DECIMETER, METER

22. Oral.

Here are two lines. The short line is 1 centimeter long. The long line is 10 centimeters long.

10 *centimeters* are 1 *decimeter.*

1. Cut a stick 1 decimeter long. Mark the centimeters on your stick.

2. How many centimeters wide is your book?

3. How many centimeters long is your finger?

4. How many decimeters wide is your desk?

5. How many decimeters are there in one edge of your handkerchief?

6. Cut a stick 10 decimeters long. Mark the decimeters on it.

10 decimeters are 1 *meter.*

7. Can you jump one meter?

8. With your meter stick find the length of your schoolhouse; the blackboard; the door.

9. Measure around your wrist, neck, and waist.

10 centimeters = 1 decimeter
10 decimeters = 1 meter

Give many exercises in measuring with these units. Keep the decimeter and meter sticks for future lessons in measuring.

10. How many decimeters are there in $\frac{1}{2}$ of a meter? In 3 meters? In $4\frac{1}{2}$ meters?

11. How many centimeters are there in 5 decimeters? In 7 decimeters? In 1 meter?

12. How many meters are there in 40 decimeters? In 60 decimeters? In 90 decimeters?

13. How many decimeters are there in 30 centimeters? In 80 centimeters?

14. How many centimeters are there in $1\frac{1}{2}$ decimeters? In $3\frac{1}{2}$ decimeters?

15. Lino's father has a square garden 20 meters on each side. How long a fence will it take to inclose it? If one peso will pay for 8 meters of fence, what will the whole fence cost?

16. If the plants are set 3 decimeters apart, how many plants will it take to set out a row 6 meters long?

17. How many sticks 2 centimeters long can be made from a stick 2 decimeters long?

Make a metric chart for the wall by drawing on a long piece of paper 3 heavy lines to represent 1 meter, 1 decimeter, and 1 centimeter.

Let the pupils estimate the length of lines on the blackboard, the length and width of the room, etc.; then measure these distances. Use the meter for long distances, and the centimeter for very short distances.

ADDITION

23. Oral.

1. Rosario has 20 eggs in her basket, and 2 eggs in her hand. How many eggs has she?

2. At 2 centavos each, what will she get for 10 eggs?

3. When she has sold all of the eggs, she will buy a string of beads for 20 centavos, and 2 meters of ribbon at 5 centavos a meter. How much will her beads and ribbon cost?

4. $20+1=$ $30+2=$ $50+3=$ $20+4=$

5. $40+5=$ $30+6=$ $20+7=$ $30+8=$

6. Rosario's brother took bananas to the market yesterday. There were 20 small bananas and 13 large bananas in his basket. How many bananas had he?

7. He sold the small bananas for 15 centavos and the large ones for 20 centavos. How much did he get for all?

Give many examples similar to 4 and 5, and require the answers to be given rapidly. Let the pupils write the answers to 1, 2, 3, 6, and 7 in simple statements.

Add:

8.	9.	10.	11.	12.	13.
20	30	60	50	10	40
40	10	30	20	70	40

14. $\frac{1}{3}$ of 12= $\frac{1}{4}$ of 12= $\frac{1}{2}$ of 20= $\frac{1}{4}$ of 20=

24. Oral.

1. There were 21 birds in one tree and 3 in another. How many birds were there in both trees?

2. Julio's brother is 21 years old. In 4 years he will be . . . years old.

3. Pablo had 31 little fish and 5 big fish. How many fish had he?

Add:

4.	5.	6.	7.	8.	9.
21	31	51	41	31	21
1	2	3	4	5	6

10.	11.	12.	13.	14.	15.
31	61	31	71	21	31
7	7	8	8	9	9

25. Written.

Add the units and the tens separately:

1.	2.	3.	4.	5.	6.
11	20	32	24	13	15
13	14	21	20	32	20

7. 22 46	8. 31 65	9. 45 14	10. 52 26	11. 71 18	12. 15 43
13. 27 12	14. 16 41	15. 51 18	16. 34 14	17. 25 33	18. 12 45
19. 3 6 9 5	20. 8 2 6 4	21. 1 3 7 9	22. 3 6 7 5	23. 6 3 8 7	24. 5 2 9 9

25. A farmer raised 43 cavanes of rice in one field and 22 cavanes in another. How much rice did he raise in both fields?

26. There are 13 meters of rope in one piece and 34 meters in another piece. In both pieces there are how many meters?

27. I sold 3 jars of sugar. In the first jar there were 14 kilos, in the second 43 kilos, and in the third 22 kilos. How much sugar did I sell?

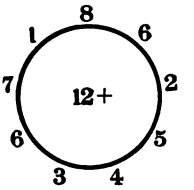
28. Mr. Santiago rode 45 kilometers and walked 14 kilometers. How far did he go?

29. I paid 30 pesos for a suit of clothes, 8 pesos for a pair of shoes, and 3 pesos for a hat. If I had 50 pesos at first, how much have I now?

Let the pupils copy 1–24 and find the sums. Let them write the answers to 25–29 in simple statements.

26. Oral.

Drill with the circle on the blackboard before beginning this lesson. Write within the circle 22, 32, 42, etc., until the pupils can add rapidly to numbers ending in 2.



1. Count by 10's from 2 to 92.

2. A flagpole 4 meters long was placed on a schoolhouse 12 meters high. How high was the top of the pole?

3. The school paid 52 centavos for the rope to pull up the flag, and 10 centavos for the pole. What was the cost of both?

Add:

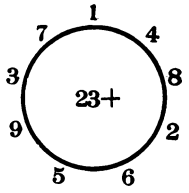
4.	12	22	32	22	42	32	22	52
	1	2	3	4	5	6	7	7
5.	12	22	42	62	2	12	22	42
	8	8	8	8	9	9	9	9

6. Francisco counted 32 acacia trees and 6 palm trees in the school yard. How many trees were in the yard?

7. How many sticks half a meter long can be cut from a bamboo pole 5 meters long?

8. How many decimeters are there in $3\frac{1}{2}$ meters?

Let the pupils copy 4 and 5 and write the sums.



27. Oral.

Use the circle for drill, as on page 71. Write within it, 33, 43, 53, etc.

1. Andres had 23 centavos in his pocket and 3 centavos in his hand. How many centavos had he?

2. A large basket holds 23 chupas, and a small basket holds 4 chupas. Both baskets hold . . . chupas.

3.	$23+1=$	$13+2=$	$33+2=$	$23+2=$
4.	$53+3=$	$23+4=$	$33+4=$	$23+5=$
5.	$33+5=$	$13+6=$	$23+6=$	$43+6=$

Add:

6.	31	7. 32	8. 33	9. 43	10. 21	11. 22
	7	7	7	7	8	8
12.	23	13. 53	14. 21	15. 22	16. 23	17. 43
	8	8	9	9	9	9

28. Written.

Add:

1.	12	2. 22	3. 40	4. 53	5. 62	6. 17
	13	36	16	14	25	80
7.	38	8. 50	9. 22	10. 66	11. 15	12. 43
	31	19	24	20	33	23

METRIC MEASURES — LITER

29. Oral.

1. Ana has a ruler $\frac{1}{2}$ of a meter long. How many decimeters long is it? How many centimeters long is it?

Ana is making a box 1 decimeter long, 1 decimeter wide, and 1 decimeter deep. This box will hold 1 *liter*. Three boxes like this will hold 1 *ganta*.

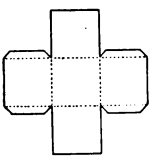
2. How many liters will a box hold that is 1 decimeter long, 1 decimeter wide, and 3 decimeters deep?

3. I have a can holding 12 liters, a box holding 42 liters, and a jar holding 25 liters. How many liters of rice will fill them all?

4. How many bottles holding $\frac{1}{2}$ of a liter each can be filled from a can holding 10 liters of oil?

5. At $1\frac{1}{2}$ pesos a liter, what did Pablo pay for 2 liters of wine?

Let the pupils cut from cardboard, fold, and paste, boxes holding 1 liter each. With the decimeter ruler made when page 66 was studied, mark and cut the cardboard like this pattern. Be careful to make each of the five squares exactly 1 decimeter on each edge. The small flaps are for pasting. Fold on the dotted lines.



ADDITION (continued)

30. Oral.

1. How many eggs are there in a dozen? In a half dozen? In 2 dozen?

2. How many 6's are there in 12? In 24?

3. I have 24 nuts in a basket and 4 nuts in my hand. How many nuts have I?

4. How many twos can I count with the nuts in the basket?

5. How many girls can take 6 nuts each from the basket?

6. Count by 2's, 3's, 4's, and 6's to 24.

7.	$\frac{1}{2}+\frac{1}{2}=$	$\frac{1}{4}+\frac{1}{4}=$	$2\times 7=$	$2\times 10=$
8.	$\frac{1}{3}+\frac{1}{3}=$	$\frac{2}{4}+\frac{1}{4}=$	$2\times 8=$	$2\times 11=$
9.	$\frac{2}{3}+\frac{1}{3}=$	$\frac{3}{4}+\frac{1}{4}=$	$2\times 9=$	$2\times 12=$

Add:

10.	24	11.	34	12.	44	13.	14	14.	24	15.	24
	3		4		5		6		6		7
16.	34	17.	4	18.	24	19.	4	20.	24	21.	34
	7		8		8		9		9		9

Drill with a circle, as on pages 71 and 72.

31. Written.

1. Pedro had 20 chickens. He bought 15 more and his father gave him 34. How many chickens had he then?

2. Maria had two 20-centavo pieces and three 5-centavo pieces. How much money had she?

3. There were 23 children in one class and 36 in another class. How many were there in both classes?

4. Mr. Cadiz had 3 pieces of rope. There were 13 meters in the first piece, 35 meters in the second, and 20 meters in the third. How many meters of rope had he?

5. A grocer paid 60 pesos for sugar and 25 pesos for tea. How much did he pay for both?

6. There are 24 houses on one side of a street and 15 on the other side. How many houses are there on both sides?

7. Paz is 13 years old and her mother is 26 years older. How old is her mother?

8. Mr. Martinez had 3 jars of coconut oil. In the first jar there were 15 liters, in the second 31 liters, and in the third 43 liters. How many liters of oil had he?

Let the pupils write in short statements the answers to 1–10.

9. Nicolas cut a piece 5 feet long and a piece 13 feet long from a 29-foot bamboo pole. How long was the piece that was left?

10. Isabel drew 4 lines on the blackboard. The first was 10 centimeters long, the second 15 centimeters, the third 24 centimeters, and the fourth 29 centimeters. The teacher asked her to draw a line as long as all four together. How long a line did she draw?

Add:

11.	12.	13.	14.	15.	16.
13	11	17	63	12	18
22	35	20	14	35	20
61	23	42	11	50	41

17.	18.	19.	20.	21.	22.
16	40	31	72	30	13
33	17	20	15	25	40
20	32	18	12	44	26

23.	24.	25.	26.	27.	28.
6	5	4	5	8	9
3	2	2	4	2	3
9	6	8	6	4	7
7	8	3	9	4	6
4	3	6	7	8	8
2	7	9	3	2	2

32. Oral.

Add:

1. 25	2. 65	3. 45	4. 35	5. 5	6. 25
1	2	3	4	5	5
7. 45	8. 5	9. 25	10. 35	11. 5	12. 25
5	6	6	6	7	7
13. 45	14. 5	15. 25	16. 35	17. 15	18. 25
7	8	8	8	9	9

19. Count by 5's to 100.

20. Count by 10's from 5 to 95.

21. A little girl has 4 large beads and 25 small beads. How many beads has she?

22. How many 5's are there in 15? In 25?

23. In a school in Paco there were 35 boys. Six more boys came to the school. How many boys were then in school?

24. A grocer wished to fill with vinegar three jars holding 20 liters, 15 liters, and 10 liters. How many liters of vinegar did he need?

25. Maximo caught 15 crabs in the morning and 13 in the evening. How many crabs did he catch that day?

Let the pupils write the table of 5's to 5×10.

33. Oral.

1. Luis has 46 matches in a box and 7 matches in his hand. How many matches has he?

2. At 2 centavos each, what will half a dozen boxes of matches cost?

3. What will be the cost of a dozen boxes?

4. If Luis bought 8 boxes and gave the clerk 20 centavos, how many centavos did he get in change?

5.	$26+1=$	$26+2=$	$26+3=$	$16+4=$
6.	$26+4=$	$36+4=$	$6+5=$	$26+5=$
7.	$36+5=$	$46+5=$	$6+6=$	$16+6=$
8.	$26+6=$	$6+7=$	$16+7=$	$26+7=$
9.	$36+7=$	$6+8=$	$16+8=$	$26+8=$
10.	$6+9=$	$16+9=$	$26+9=$	$36+9=$
11.	$\frac{1}{2}$ of $10=$	$\frac{1}{2}$ of $12=$	$\frac{1}{2}$ of $14=$	$\frac{1}{2}$ of $16=$

34. Written.

Add:

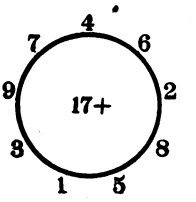
1.	2.	3.	4.	5.	6.
16	26	36	76	46	25
21	43	22	10	53	34

Let the pupils make other oral problems about the matches.

35. Oral.

Use the circle for drill, as on page 64. Write within it 27, 37, 47, etc.

1. In 27 there are . . . tens and . . . units.



2. I see 7 pens in a box and 14 pens on the table. How many pens do I see?

3. Count by 10's from 7 to 97.

4. Pablo had a kite string 32 meters long and he added 9 meters of string to it. How long was it then?

5. Felisa paid 27 centavos for potatoes and 9 centavos for tomatoes. What did she spend?

Add:

6. 7	7. 27	8. 27	9. 47	10. 17	11. 27
3	3	4	4	5	5
12. 17	13. 27	14. 27	15. 37	16. 17	17. 27
6	6	7	7	8	8

36. Written.

Add:

1. 7	2. 3	3. 2	4. 6	5. 13	6. 21
2	8	7	7	24	35
5	7	9	8	12	13

37. Oral.

1. Count to 28 by 2's and 4's.

2. In 38 there are . . . tens and . . . units.

3. 18 chickens are under a tree and 5 are on a box. How many chickens are there?

4. $8+4=$ $8+5=$ $8+6=$ $8+7=$

5. How many bells are 8 bells and 28 bells?

6. There were 8 girls in one room and 26 girls in another room. How many girls were there in both rooms?

7. Carmen had 18 meters of white lace and 7 meters of black lace. How many meters of lace had she?

8. Carmen's brother is 17 years old. How old will he be in 8 years?

9. There were 38 small candles and 5 large candles in a church. How many candles were there in the church?

10. A desk top is 1 meter long and $\frac{1}{2}$ meter wide. How many decimeters around it?

11. The teacher has a box with 38 pens in it. If she buys 7 pens, how many will she then have?

Let the pupils write the answers to 6–11 in statements.

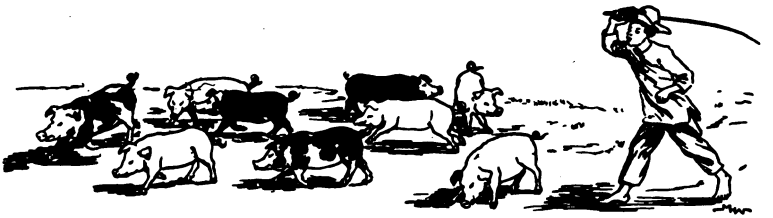
Add:

12. 28 2	13. 38 2	14. 28 3	15. 48 3	16. 18 4	17. 28 4
18. 28 5	19. 38 5	20. 8 6	21. 28 6	22. 28 7	23. 38 7
24. 8 8	25. 28 8	26. 48 8	27. 8 9	28. 28 9	29. 38 9

38. Written.

Add:

1. 18 21	2. 28 30	3. 42 16	4. 33 26	5. 47 32	6. 48 41
7. 2 5 3 8 7 4	8. 5 6 3 7 8 18	9. 4 2 6 3 7 24	10. 8 3 7 2 8 5	11. 7 2 5 6 3 9	12. 2 5 6 3 8 7
13. 5 2 4 7 9 11	14. 8 5 6 3 7 42	15. 2 7 9 3 8 35	16. 6 3 5 4 2 39	17. 5 2 4 8 3 56	18. 4 6 3 7 2 44



39. Oral.

1. How many pigs is Justo driving?

2. Justo's father had 19 little pigs. Nine of them ran away. How many were left?

3. If each pig is worth 2 pesos, how much can he get for the pigs that Justo is driving?

4. If he has 19 pigs and buys 5 more, how many will he then have?

5.	$9+1=$	$19+1=$	$29+1=$	$39+1=$
6.	$9+2=$	$19+2=$	$29+2=$	$39+2=$
7.	$9+3=$	$19+3=$	$29+3=$	$39+3=$
8.	$9+4=$	$19+4=$	$29+4=$	$39+4=$
9.	$9+5=$	$19+5=$	$29+5=$	$39+5=$
10.	$9+6=$	$19+6=$	$29+6=$	$49+6=$
11.	$9+7=$	$19+7=$	$29+7=$	$59+7=$
12.	$9+8=$	$19+8=$	$29+8=$	$49+8=$
13.	$9+9=$	$19+9=$	$29+9=$	$59+9=$

Let the pupils make problems about pigs, and write the answers to their problems in simple statements.

REVIEW OF ADDITION

40. Oral.

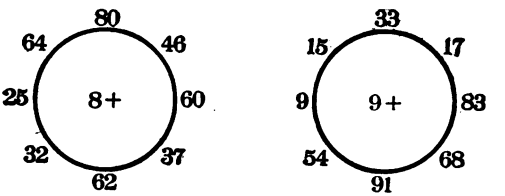
Add:

1. 9 7	2. 27 3	3. 15 7	4. 21 6	5. 13 8	6. 22 9
7. 28 5	8. 46 4	9. 38 7	10. 56 3	11. 72 8	12. 91 5
13. 7 49	14. 8 26	15. 6 35	16. 9 32	17. 4 48	18. 5 69
19. 40 10	20. 30 30	21. 80 10	22. 50 50	23. 60 20	24. 10 50

25. $\frac{1}{4}$ of 16 = $\frac{1}{4}$ of 20 = $\frac{1}{2}$ of 16 = $\frac{1}{3}$ of 18 =

26. Count by 2's to 30. Count by 3's to 36.

27. Count by 4's to 48. Count by 5's to 100.



Write different numbers within the circles for drill in addition. Require the answers to be given rapidly.

41. Written.

1. Write in words: 35, 46, 22, 78, 54, 9, 47, 39.

Write in figures:

2. Thirty-seven.
3. Twenty-nine.
4. Fourteen.
5. Eighty-seven.
6. Ninety-three.
7. Seventy-one.
8. Fifty-five.
9. Sixty-four.

Add:

10.	11.	12.	13.	14.	15.	16.
6	7	2	3	4	7	9
3	9	1	8	7	7	1
8	2	5	8	8	6	8
4	3	8	4	9	2	4
10	6	13	15	2	9	5

17.	18.	19.	20.	21.	22.
25	72	30	18	54	10
34	16	47	81	24	80
40	11	22	50	21	19

23.	24.	25.	26.	27.	28.
14	10	23	20	34	16
25	75	65	54	50	72
30	13	11	25	14	10

29. $13+52+30=$
30. $22+45+23=$
31. $31+17+50=$
32. $42+25+32=$

42. Written.

1. A fisherman caught 24 fish on Monday and 43 on Tuesday. How many fish did he catch in the two days?

2. In a small room there were 15 desks, and in a large room there were 34 desks. How many desks were there in both rooms?

3. One hen has 14 chickens and another has 23. Both hens have how many chickens?

4. I counted 32 oranges on a tree, 24 on the ground, and 23 in a basket. How many oranges did I count?

5. A man walked 25 kilometers, and then rode 13 kilometers in a carromata, and 54 kilometers on a train. How far did he go?

6. Angel counted 24 birds in a tree, 32 on the ground, and 23 on a fence. How many birds did he count?

7. Rita bought 16 white chickens and 13 black ones, and put them with 20 she already had. How many chickens did she then have?

8. A hat cost 75 centavos, a necktie 10 centavos, and a collar 12 centavos. What did they all cost?

Let the answers to problems 1–8 be written in short statements.

43. Written.

1. If 2 pesos will pay for 10 meters of fence, how much will it cost to inclose a garden 21 meters long and 14 meters wide?

2. A little boy picked up 24 shells on Wednesday, 33 on Thursday, and 40 on Friday. How many shells did he pick up?

3. There were 14 boys in one class, 22 in a second, and 31 in a third. How many boys were there in all three classes?

4. Mr. Barros bought 35 liters of rice from one man, 44 liters from another, and 20 liters from a third. How much rice did he buy?

5. Candido traded 2 buri hats worth 30 centavos each for soap at 20 centavos a cake. How many cakes of soap did he get?

6. Mrs. Francisco paid 25 pesos for a sewing machine, 2 pesos for a pair of scissors, 11 pesos for a mirror, and 21 pesos for a piece of piña. Find the cost of all.

7. What must I pay for a dozen rattan chairs costing 26 pesos, a clock worth 13 pesos, and a violin worth 30 pesos?

See note on page 85.

SUBTRACTION

44. Oral.

1. Alfredo is buying 2 loaves of bread for 3 centavos each. He gives the baker a 10-centavo piece. How many centavos in change will he get?

2. Dolores has come for some cakes. What must she pay for 7 cakes at 1 centavo each? If she gives the baker a 10-centavo piece, how much change will she get?

3. If the baker made 10 cakes and sold $\frac{1}{2}$ of them, how many were left?

4. If he baked 27 loaves of bread and sold 21, how many loaves were left?

Subtract:

5. 8	6. 5	7. 9	8. 7	9. 8	10. 9	11. 6
3	4	2	5	6	7	4

12. 13	13. 12	14. 10	15. 13	16. 14	17. 12
5	7	5	3	5	9

45. Oral.

The sign of subtraction (−) is read *minus*.
5−2=3 is read, 5 *minus* 2 equals 3.

1.	7−4=	8−2=	6−3=	9−6=
2.	6−1=	9−4=	8−5=	7−3=
3.	8−4=	5−5=	6−5=	8−7=

4. I had 12 pins. I gave Maria 5 pins. Now I have . . . pins.

5. Paula has 13 nuts. If she eats 3 nuts, she will have . . . nuts left.

6. There were 11 spoons on the table. Josefa took away 4 of them and left . . .

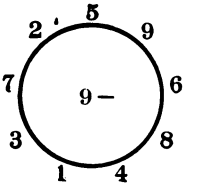
7. Juan had 10 pens. He gave me 2 pens. How many pens had he then?

8.	10−3=	4−3=	7+?=10
9.	11−4=	11−3=	6+?=11
10.	12−6=	13−6=	8+?=14
11.	15−5=	14−8=	7+?=11
12.	12−2=	8−1=	6+?=10
13.	$\frac{2}{2}-\frac{1}{2}=$	$\frac{2}{4}-\frac{1}{4}=$	5+?= 9
14.	$\frac{3}{4}-\frac{1}{4}=$	$\frac{2}{3}-\frac{1}{3}=$	7+?=12

Oral examples like those above should be continued until the pupils can perform quickly any subtractions involving numbers to 20. Give many oral problems similar to 4, 5, 6, and 7. Let the pupils make problems similar to 4, 5, 6, and 7 for 8, 9, 10, and 11.

46. Oral.

Use the circle for rapid drill in subtraction. When the teacher points to a number outside the circle, a pupil states the difference between that number and 9. For example, when the pointer is on 3, the pupil says 6. Use within the circle 19, 29, 39, 49, etc.



1. Pedro had 9 centavos. He paid 5 centavos for a top and had . . . centavos left.

2. There were 19 birds in a tree. Seven flew away. How many were left in the tree?

3. Josefa's mother wove 29 meters of sinamay. She sold 24 meters and had . . . meters left.

Subtract:

4. 19	5. 19	6. 19	7. 19	8. 19	9. 19
3	5	9	10	8	6
10. 19	11. 19	12. 19	13. 19	14. 19	15. 19
12	17	11	16	18	14

47. Written.

Subtract the units, then the tens:

1. 29	2. 29	3. 39	4. 49	5. 49	6. 59
13	21	15	24	36	23

Let the pupils write the answers to 1, 2, and 3, sec. 46, in simple statements. Let them copy and subtract 1–6, sec. 47.

48. Oral.

Subtract:

1. 8	2. 8	3. 8	4. 8	5. 8	6. 8	7. 8
1	2	3	4	5	6	7
8. 18	9. 18	10. 18	11. 18	12. 18	13. 18	
11	12	13	14	15	16	

14. $18-8=$ $18-9=$ $18-10=$

15. $3-2\frac{1}{2}=$ $4-3\frac{1}{2}=$ $5-4\frac{1}{2}=$

16. Felisa has 18 eggs in her basket. If I buy 6 of them, how many will she have left?

17. I have a string 38 inches long. If I cut off 9 inches, how long will the string be?

18. I see 28 beads. 25 beads are white and the rest are red. How many red beads do I see?

49. Written.

Subtract:

1. 28	2. 38	3. 48	4. 58	5. 68	6. 78
13	21	36	15	47	54

7. $19+?=28$ $29+?=38$ $39+?=48$

8. $49+?=58$ $59+?=68$ $69+?=78$

Let the pupils write examples 7 and 8 in the form given, supplying the missing numbers.

50. Oral.

1. Basilio is 16 years old, and his sister is 2 years younger. How old is his sister?

2. There were 17 liters of oil in a tank. Leon dipped out 5 liters. How many liters were left in the tank?

3. I have 27 seeds. If I plant 6 seeds, how many will be left?

Subtract:

4. 16 − 6	5. 16 − 7	6. 16 − 8	7. 16 − 9	8. 26 − 7	9. 36 − 8
10. 17 − 7	11. 17 − 8	12. 17 − 9	13. 27 − 7	14. 37 − 28	15. 47 − 39

51. Written.

1. A man paid 32 pesos for a bed and 17 pesos for a table. What did he pay for both?

2. A boy had 46 pictures. He gave away 13. How many had he then?

3. A pig and a cow cost 67 pesos. The pig cost 13 pesos. What was the cost of the cow?

Let the pupils write in simple statements the answers to 1–3, sections 50 and 51.

52. Oral.

1. There are 17 liters of water in the large jar. The small jar will hold 6 liters or . . . chupas. If Isabel fills the small jar with water from the large jar, how much water will be left in the large jar?

2. Her cup holds $\frac{1}{2}$ of a liter. How many times will 1 ganta of water fill her cup?

3. How many times can she fill her cup from the small jar of water?

53. Written.

Subtract:

1. 36	2. 56	3. 76	4. 47	5. 67	6. 87
21	34	52	33	45	36
7. 88	8. 97	9. 86	10. 79	11. 68	12. 77
42	34	43	38	25	13

Give other problems about the picture.

54. Oral.

Subtract:

1.	14	2.	14	3.	14	4.	14	5.	14	6.	14
	5		6		7		8		9		10
7.	15	8.	15	9.	15	10.	15	11.	25	12.	35
	5		6		7		8		9		30

13. A boy caught 14 small fish, and sold 4 of them. How many were left?

14. There were 25 bananas in two bunches. In one bunch there were 7. How many were there in the other?

15. At 3 centavos each, what will 5 mangos cost?

16. There are 34 candles in a church. 9 candles are burning. How many are not burning?

Subtract:

17.	24	18.	34	19.	54	20.	75	21.	45	22.	95
	20		30		50		70		40		90
23.	36	24.	66	25.	47	26.	77	27.	28	28.	98
	30		20		40		70		20		90

Give frequent oral drills in subtracting numbers 1 to 9 from the numbers 11 to 20. Pupils find these subtractions most difficult.

55. Written.

Subtract:

1. 34	2. 64	3. 75	4. 56	5. 94	6. 85
12	33	42	31	71	55
7. 84	8. 77	9. 98	10. 65	11. 95	12. 79
44	33	83	34	73	15

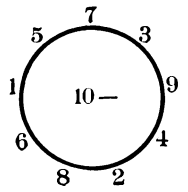
56. Oral.

1. A farmer had 13 pigs. When 7 of them died, how many were left?

2. There are 8 gantas of water in a 12-ganta jar. How many more gantas of water can I put into the jar?

3. Ramon had 13 centavos. He bought 6 chicos at 1 centavo each. How much money had he left?

4. Castro had 15 nuts. He ate $\frac{1}{3}$ of them and gave away $\frac{1}{3}$. How many nuts had he left?



5. $8+?=10$ $4+?=10$ $3+?=10$

6. $6+?=11$ $7+?=11$ $8+?=11$

7. $3+?=12$ $8+?=12$ $5+?=12$

8. $5+?=13$ $7+?=13$ $9+?=13$

Use the circle for drill in subtraction, as on page 76. Write within it 11, 12, and 13. Require answers instantly.

57. Oral.

1. There were 80 coconuts in a banca. Eight of them fell into the river. How many coconuts were then in the banca?

2. If the man rows 3 miles an hour, how far will he row in 6 hours?

3. If he sells the coconuts at 6 centavos each, how much will he get for half a dozen?

4. If the man earns 4 pesos a week by rowing the boat, what will he earn in a month?

5. $20-19=$ $21-19=$ $22-19=$ $23-19=$

6. $20-18=$ $21-18=$ $22-18=$ $23-18=$

7. $20-17=$ $21-17=$ $22-17=$ $23-17=$

8. $20-16=$ $21-16=$ $22-16=$ $23-16=$

9. $20-15=$ $21-15=$ $22-15=$ $23-15=$

10. $20-14=$ $21-14=$ $22-14=$ $23-14=$

11. Find $\frac{1}{3}$ of 21; $\frac{1}{2}$ of 22; $\frac{1}{4}$ of 40; $\frac{1}{2}$ of 24.

12. $1\frac{1}{2}+\frac{1}{2}=$ $2\frac{1}{2}+\frac{1}{2}=$ $4\frac{1}{2}+\frac{1}{2}=$ $6\frac{1}{2}+\frac{1}{2}=$

Place the examples 5 to 12 on blackboard. After taking them in regular order, use the pointer and ask for them out of their regular order.

REVIEW OF ADDITION AND SUBTRACTION

58. Oral.

1. $18-13=$ $68-65=$ $38-7=$ $84-82=$
2. $27-2=$ $33-7=$ $25-8=$ $93-3=$
3. $15-7=$ $28-20=$ $73-6=$ $69-9=$
4. $39-34=$ $17-15=$ $56-5=$ $46-8=$
5. $21-5=$ $72-2=$ $94-9=$ $27-9=$
6. $36-9=$ $45-6=$ $55-8=$ $52-3=$
7. $19-7=$ $62-9=$ $39-34=$ $66-6=$
8. $27-8=$ $75-71=$ $91-2=$ $69-61=$

Subtract:

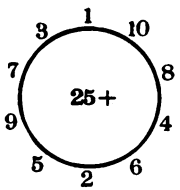
9. 31	10. 42	11. 50	12. 66	13. 24	14. 56
7	2	47	65	6	7
15. 23	16. 35	17. 37	18. 42	19. 93	20. 39
3	9	5	4	89	35

21. Count by 2's to 50. Count by 3's to 45.

22. Count by 4's to 48. Count by 5's to 100.

23. $1\frac{1}{2}+1\frac{1}{2}=$ $3+1\frac{1}{2}=$ $4+2\frac{1}{2}=$ $5+4\frac{1}{2}=$

24. $2\frac{1}{2}+2\frac{1}{2}=$ $1\frac{1}{4}+3\frac{1}{4}=$ $3\frac{1}{3}+4\frac{2}{3}=$



Place the circle on the blackboard. Write within the circle any of the numbers from 10 to 100. Drill in addition and subtraction.

Much of the abstract written work from this time should be dictated by the teacher and placed on the board by the pupils.

59. Written.

Add:

1. 43	2. 71	3. 36	4. 50	5. 16	6. 23
54	28	53	39	80	44
7. 21	8. 47	9. 12	10. 24	11. 30	12. 3
13	20	41	32	14	24
34	11	46	3	21	20
13. 2	14. 7	15. 8	16. 9	17. 7	18. 8
3	8	2	2	3	4
5	2	4	8	8	2
6	5	6	3	2	7
9	6	6	7	5	3
7	3	4	6	9	9
8	9	3	5	3	5
4	6	2	12	24	36

Subtract:

19. 95	20. 76	21. 87	22. 69	23. 58	24. 75
32	24	46	32	41	63
25. 48	26. 67	27. 46	28. 73	29. 89	30. 57
33	25	26	50	26	16

Let the pupils copy and write the answers.

60. Oral.

1. There are 20 stones on the cart and 11 on the ground. How many stones are there on the cart and on the ground?

2. If 12 stones will build 1 meter of wall, how many will it take to build 3 meters of wall?

3. If one man earns 1 peso a day and the other $1\frac{1}{4}$ pesos a day, what do both men earn in a day?

4. How many sides has one stone? How many corners have three stones?

5. Mr. Cid had 48 mangos. Five were large and the rest were small. How many small mangos had he?

6. A farmer had 37 cows. Eight cows died. How many had he then?

7. A river is 40 meters wide. If Lope swam across the river and back, how many meters did he swim?

8. Maria had 27 yards of sinamay. She used 22 yards for a dress and had . . . yards left.

61. Written.

1. There are 30 days in April, 31 in May, and 30 in June. In the three months there are... days.

2. Mr. Solis had 47 cavanes of rice. He gave 15 cavanes to his son and had . . . cavanes left.

3. A baker made 32 cakes on Monday, 25 on Tuesday, and 30 on Wednesday. How many cakes did he make in the three days?

4. It is 23 meters from Pablo's house to the store and 33 meters from his house to school. How many meters did he walk if he went to the store and returned home, then went to school?

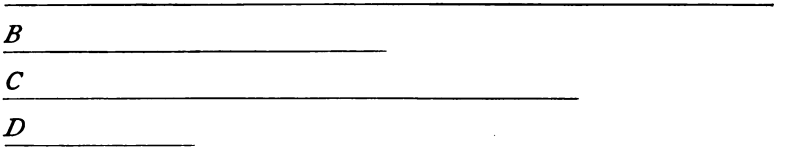
5. Ana's new book had 97 pages. She read 12 pages one evening and 25 the next morning. How many pages were left to be read?

6. A farmer paid 98 pesos for a carabao and 64 pesos for a horse. How much more did the carabao cost than the horse?

7. Manuel spent 60 centavos for a hat and 22 centavos for a book. If he had 95 centavos at first, how much was left?

8. From a box holding 58 gantas of rice Mr. Diego took out 25 gantas and 12 gantas. How much was left?

Let the pupils write the answers in simple statements.



62. Oral.

1. If A is 4, what is B? What is C?
2. If A is 4, what is D? What is $B+D$?
3. B is what part of A?
4. D is what part of A?
5. D is what part of C?
6. If D is 10, what is A? B? C?
7. If B is 20, what is A? D?
8. If D is 1, what is $A+B+C+D$?
9. B is what part of C?
10. A is how many times D?
11. A is how many times B?
12. If C is 60, what is D? What is B?
13. If A is 100, what is B? What is D?
14. Which is the longest line? The shortest?
15. Draw a line twice as long as A.
16. Draw a line three times as long as C.
17. If D is 1 inch long, how many lines like D will make 1 yard? How many like B?

MULTIPLICATION

63. Oral.

1. At 2 centavos each, what will 3 oranges cost?

If 1 orange costs 2 centavos, 3 oranges will cost 3 times 2 centavos, or 6 centavos.

2. If Leon earns 5 pesos in one week, how much does he earn in two weeks?

If Leon earns 5 pesos in one week, in 2 weeks he earns 2 times 5 pesos, or 10 pesos.

3. What will 3 loaves of bread cost at 6 centavos each?

4. How many wings have 4 birds?

5. How many horns have 6 carabaos?

6. At 7 centavos a pound, what must I pay for 2 pounds of sugar?

7. $3 \times 3 =$ $4 \times 4 =$ $3 \times 5 =$ $5 \times 2 =$

8. Juana buys 2 cakes of soap at 8 centavos a cake. How much does she pay?

9. How many chicos are there in 2 dozen?

10. How much will 5 coats cost at 3 pesos each?

11. $2 \times 8 =$ $6 \times 2 =$ $4 \times 3 =$ $2 \times 10 =$

Let the answers to 3, 4, 5, etc., be given in form similar to the models given for 1 and 2.

2× 1= 2	3× 1= 3	4× 1= 4	5× 1= 5	6× 1= 6
2× 2= 4	3× 2= 6	4× 2= 8	5× 2=10	6× 2=12
2× 3= 6	3× 3= 9	4× 3=12	5× 3=15	6× 3=18
2× 4= 8	3× 4=12	4× 4=16	5× 4=20	6× 4=24
2× 5=10	3× 5=15	4× 5=20	5× 5=25	6× 5=30
2× 6=12	3× 6=18	4× 6=24	5× 6=30	6× 6=36
2× 7=14	3× 7=21	4× 7=28	5× 7=35	6× 7=42
2× 8=16	3× 8=24	4× 8=32	5× 8=40	6× 8=48
2× 9=18	3× 9=27	4× 9=36	5× 9=45	6× 9=54
2×10=20	3×10=30	4×10=40	5×10=50	6×10=60
2×11=22	3×11=33	4×11=44	5×11=55	6×11=66
2×12=24	3×12=36	4×12=48	5×12=60	6×12=72

64. Oral.

1. Learn the tables of 2's and 3's.
2. How many days are there in 2 weeks?
3. How many chupas are there in 2 gantas? In 3 gantas?
4. 3 times 11 centavos are how many centavos?
5. How many 3's are there in 18? In 24?
6. How many feet have 8 birds?
7. How many decimeters are there in 2 meters?
8. How many feet are there in 9 yards?
9. What will 10 cakes cost at 3 centavos each?

Give frequent oral drills on the tables. Do not ask for products in the order given in the tables. Give oral problems involving the tables learned. Emphasize the point that $3 \times 2 = 2 \times 3$, etc. Let the pupils write problems about 2×6 and 3×9.

10.	$2 \times 4 =$	$3 \times 6 =$	$2 \times 9 =$	$8 \times 2 =$
11.	$5 \times 3 =$	$7 \times 2 =$	$4 \times 2 =$	$9 \times 3 =$
12.	$2 \times 6 =$	$4 \times 3 =$	$10 \times 2 =$	$3 \times 7 =$
13.	$2 \times 11 =$	$6 \times 3 =$	$3 \times 12 =$	$2 \times 12 =$

65. Written.

Multiply the units, then the tens:

1. 21	2. 32	3. 24	4. 40	5. 43	6. 44
2	2	2	2	2	2
7. 30	8. 21	9. 13	10. 23	11. 22	12. 32
3	3	3	3	3	3

66. Oral.

1. Learn the table of 4's.

2. How many fingers are there on 4 hands?

3. How many centimeters in 4 decimeters?

4. What will 12 meters of ribbon cost at 4 centavos a meter?

5. A cook earned 7 pesos in 1 week. What did he earn in 4 weeks?

6. There were 8 girls in a class. Each girl wrote 4 lines. How many lines did they all write?

7. A boy had 16 marbles and found 4. How many marbles had he then?

8. Alfonso is 10 years old. In how many years will he be 14?

9.	$4\times 5=$	$6\times 4=$	$3\times 9=$	$4\times 4=$
10.	$2\times 11=$	$4\times 7=$	$5\times 4=$	$7\times 3=$
11.	$4\times 11=$	$7\times 4=$	$3\times 12=$	$2\times 8=$
12.	$3\times 6=$	$4\times 9=$	$8\times 4=$	$9\times 4=$
13.	$10\times 4=$	$11\times 4=$	$12\times 4=$	$11\times 3=$

67. Written.

Multiply:

1.	2.	3.	4.	5.	6.
34	20	20	22	42	33
2	3	4	4	2	3

Add:

7.	8.	9.	10.	11.	12.
14	40	25	11	24	34
23	18	42	75	63	60
52	31	30	13	10	5

Subtract:

13.	14.	15.	16.	17.	18.
78	95	83	67	39	56
34	61	23	25	33	40

68. Oral.

1. Alipio is in the garden. He is getting radishes and tomatoes to take to the market. If he ties 5 radishes in each bunch, how many radishes will he need to make 5 bunches?

2. At 10 centavos a bunch, how much will he get for 5 bunches of radishes?

3. If he sells 3 tomatoes for 5 centavos, how many tomatoes will he sell for 10 centavos? How many for 25 centavos?

4. Learn the table of 5's.

Multiply:

5. 9 × 5	6. 5 × 4	7. 7 × 5	8. 12 × 5	9. 5 × 8	10. 5 × 9
11. 5 × 6	12. 11 × 5	13. 10 × 5	14. 5 × 7	15. 5 × 3	16. 8 × 5

Let the pupils write the answers to 1, 2, and 3 in form similar to the models on page 101.

69. Oral.

1. Count by 6's to 72. Learn the table of 6's.

2. I have 6 hens; each hen has 10 chickens. How many chickens have I?

3. A carpenter worked 8 hours each day. How many hours did he work in 6 days?

4. At 2 for a centavo, what will 12 onions cost?

5. At 5 pesos a ton, how many pesos must I pay for 6 tons of coal?

6. How many months in 5 years?

7.	$3\times 6=$	$7\times 2=$	$4\times 5=$	$5\times 9=$
8.	$6\times 2=$	$6\times 5=$	$6\times 8=$	$6\times 9=$
9.	$4\times 10=$	$11\times 5=$	$3\times 8=$	$7\times 6=$
10.	$2\times 12=$	$4\times 4=$	$9\times 3=$	$10\times 4=$
11.	$6\times 7=$	$6\times 11=$	$6\times 12=$	$12\times 6=$
12.	$8\times 6=$	$7\times 12=$	$6\times 6=$	$5\times 6=$

Multiply:

13.	14.	15.	16.	17.	18.
7	5	6	8	6	12
6	8	9	6	7	6
19.	20.	21.	22.	23.	24.
8	11	3	4	4	5
5	4	9	8	9	9

Let the pupils write the tables of 4's, 5's, and 6's from memory.

REVIEW OF MULTIPLICATION

70. Oral.

1.	$2 \times 5 =$	$2 \times 12 =$	$6 \times 11 =$	$6 \times 8 =$
2.	$9 \times 3 =$	$3 \times 7 =$	$5 \times 6 =$	$2 \times 9 =$
3.	$7 \times 4 =$	$5 \times 10 =$	$3 \times 4 =$	$3 \times 5 =$
4.	$8 \times 2 =$	$6 \times 8 =$	$7 \times 3 =$	$5 \times 4 =$
5.	$5 \times 9 =$	$3 \times 9 =$	$4 \times 8 =$	$3 \times 11 =$
6.	$6 \times 7 =$	$4 \times 12 =$	$5 \times 7 =$	$5 \times 12 =$

7. Pablo is 13 years old and his father is 3 times as old. How old is his father?

8. An orchard has 5 rows of trees and there are 12 trees in each row. How many trees are there in the orchard?

9. If 6 boxes of matches cost 10 centavos, what must I pay for 5 dozen boxes?

10. If Dolores has 4 5-centavo pieces, how many half-centavos can she get for them?

11. Lucila set out 3 rows of plants in the garden. If she put 11 plants in each row, how many plants did she set out?

12. Lope sold 4 baskets holding 5 oranges each and 2 baskets holding 10 oranges each. How many oranges did he sell?

13. What will $4\frac{1}{2}$ meters of lace cost at 20 centavos a meter?

14. Find the cost of 6 bamboo chairs at $1\frac{1}{2}$ pesos each and a flatiron worth $1\frac{1}{2}$ pesos.

15. I filled 6 8-liter jars with vinegar and had $2\frac{1}{2}$ liters left. How much had I at first?

16. How much did Mrs. Sanchez pay for 5 meters of sinamay at 11 centavos a meter and 2 spools of thread at 20 centavos a spool?

17. Maximo counted 9 buyo palm trees on the way to school and Pia counted 3 times as many. How many did they both count?

18. A carpenter bought 2 saws at 3 pesos each, a hammer for $1\frac{1}{2}$ pesos, and a plane for 4 pesos. What did he pay for all?

19. Rita bought 5 12-yard bolts of tape and 6 5-yard bolts. How many yards of tape did she buy?

20. I bought a dozen pencils at 5 centavos each and sold them all for 75 centavos. What did I gain?

21. Find the cost of 6 coconuts at 5 centavos each and 5 pineapples at 9 centavos each.

Ask for the oral analysis of each of these problems.

METRIC MEASURES — KILO

71. Oral.

A liter of water weighs 1 *kilo.*

1. If a jar holds 12 liters, what is the weight of the water that fills it?

2. If sugar is $1\frac{1}{2}$ times as heavy as water, what is the weight of the sugar that will fill a 12-liter jar?

3. If silver is $10\frac{1}{2}$ times as heavy as water, what is the weight of a block of silver 1 decimeter long, 1 decimeter wide, and 1 decimeter high?

4. If alcohol is $\frac{2}{3}$ as heavy as water, what is the weight of 6 liters of alcohol?

5. If 4 kilos of sugar cost 1 peso, what will 20 kilos cost?

6. If ham is 90 centavos a kilo, what part of a kilo can be bought for 30 centavos?

7. If onions are 18 centavos a kilo, what part of a kilo can be bought for 3 centavos?

8. What will $2\frac{1}{2}$ kilos of nails cost at 20 centavos a kilo?

9. What must I pay for 3 kilos of tea at 2 pesos a kilo, and $5\frac{1}{2}$ kilos of coffee at 1 peso a kilo?

DIVISION

72. Oral.

1. Take 6 sticks. Lay them in groups of 2 sticks each. How many groups have you?

2. There are . . . 2's in 6.

3. How many 2's in 8? In 12? In 16?

To find how many 2's there are in a number, divide the number by 2.

$6 \div 2 = 3$ is read, 6 *divided by* 2 equals 3.

4. $8 \div 2 =$ $10 \div 2 =$ $12 \div 2 =$ $14 \div 2 =$

5. $16 \div 2 =$ $18 \div 2 =$ $20 \div 2 =$ $22 \div 2 =$

6. If 2 pencils cost 6 centavos, what is the cost of 1 pencil?

If 2 pencils cost 6 centavos, 1 pencil will cost $\frac{1}{2}$ of 6 centavos, or 3 centavos.

7. At 2 centavos each, how many tops can I buy for 10 centavos?

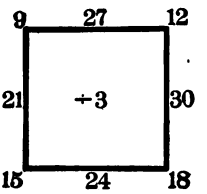
If 1 top costs 2 centavos, I can buy as many tops for 10 centavos as there are 2's in 10, or 5 tops.

8. If 1 hat costs 2 pesos, how many hats can I buy for 14 pesos?

9. If 2 slates cost 18 centavos, what is the cost of 1 slate?

Let the answers to 8 and 9 be similar to 6 or 7.

73. Oral.



1. Count by 3's to 36.
2. How many 3's in 9?
3. How many 3's in 15?

To find how many 3's there are in a number, divide the number by 3.

4. $3 \div 3 =$ $6 \div 3 =$ $12 \div 3 =$ $15 \div 3 =$

$3\overline{)9}$ is read, 9 *divided by* 3 equals 3.

3

5. $3\overline{)18}$ 6. $3\overline{)21}$ 7. $3\overline{)24}$ 8. $3\overline{)27}$ 9. $3\overline{)30}$

10. How many triangles can you make with 15 sticks?

11. At 3 centavos each, how many fish can you buy for 21 centavos?

Use the square for blackboard drill in division. Give oral problems similar to 10 and 11. See page 110 for models for answers.

74. Written.

Divide the tens, then the units:

1. $2\overline{)28}$ 2. $2\overline{)42}$ 3. $3\overline{)39}$ 4. $3\overline{)60}$ 5. $2\overline{)80}$
6. $2\overline{)48}$ 7. $3\overline{)69}$ 8. $3\overline{)93}$ 9. $2\overline{)88}$ 10. $3\overline{)66}$

To find $\frac{1}{2}$ of a number, divide the number by 2.

11. What is $\frac{1}{2}$ of 44? Of 84? Of 68? Of 82?
12. What is $\frac{1}{3}$ of 27? Of 60? Of 93? Of 69?

13. Gil had 84 centavos. He spent $\frac{1}{2}$ of his money for a book and $\frac{1}{2}$ of the part that was left for a knife. How much had he then?

14. What will half of a kilo of ham cost at 88 centavos a kilo?

15. Esteban bought a 10-centavo bottle of ink, a 20-centavo tablet, and a 33-centavo box of candy. He found he had $\frac{1}{3}$ enough money to pay for them. How much money did he have?

16. How many mats each 3 meters long can be made from a 38-meter roll of matting? How many meters will be left?

17. Mr. Agrava sold 6 pigs at 9 pesos each. He spent 6 pesos for meat and rice, and with the rest of the money he bought maize at 2 pesos a cavan. How many cavanes of maize did he buy?

18. How many goats at 3 pesos each will pay for 10 sheep at 6 pesos each?

19. Maximo and Consuelo had 66 centavos each. Maximo spent $\frac{1}{2}$ of his and Consuelo spent $\frac{1}{3}$ of hers. They gave what was left to Luz. How much did Luz receive?

Let the pupils write in short statements the analysis for each of these problems.

75. Oral.

1. How many 4's in 8? In 12? In 16?

2. $4\overline{)20}$ 3. $4\overline{)28}$ 4. $4\overline{)36}$ 5. $4\overline{)40}$ 6. $4\overline{)48}$

7. What is $\frac{1}{4}$ of 24? Of 32? Of 44? Of 16?

8. If 4 chairs cost 24 pesos, what was the cost of 1 chair?

9. A man earned 20 pesos in 1 month. How much did he earn in 1 week?

10. If it takes 4 yards of jusi for 1 camisa, how many camisas can be made from 32 yards?

11. At 4 pesos each, how many hats can be bought for 48 pesos?

12. I spent $\frac{1}{4}$ of my money for a picture. The picture cost 7 pesos. How much money had I at first?

13. Lorenzo sells 24 chupas of milk each morning and $\frac{1}{4}$ as much each evening. How many chupas does he sell in 2 days?

76. Oral.

1. How many 5's in 10? In 20? In 30?

2. $5\overline{)15}$ 3. $5\overline{)25}$ 4. $5\overline{)35}$ 5. $5\overline{)40}$ 6. $5\overline{)55}$

7. How many 5-centavo pieces can you get for a half-peso?

8. How many 5-liter jars can be filled with 45 liters of oil?

9. How many pieces 5 meters long can be cut from a coil of rope 60 meters long?

10. If a man traveled 55 kilometers in 5 days, how far did he travel in 1 day?

11. Ricardo had 35 chickens. He sold $\frac{1}{5}$ of them. How many had he left?

12. How many coconuts at 5 centavos each can I buy with 30 centavos?

77. Oral.

1. Count by 6's to 72.

2. What is $\frac{1}{6}$ of 12? Of 30? Of 24? Of 60?

3. At 6 centavos each, how many papayas can I buy for 18 centavos?

4. How many 6-inch sticks can I make from a stick 1 yard long?

5. In 6 equal rows there are 60 lemon trees. How many trees are there in each row?

6. $6\overline{)42}$ 7. $6\overline{)54}$ 8. $6\overline{)48}$ 9. $6\overline{)66}$ 10. $6\overline{)72}$

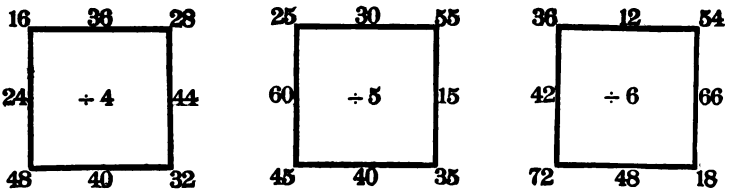
11. Pilar had 72 centavos. She paid $\frac{1}{6}$ of her money for a string of beads. How much had she left?

12. I have 54 bananas. To how many boys can I give half a dozen bananas each?

Require the answers to these problems in full statements.

REVIEW OF DIVISION

78. Oral.



1. $12 \div 4 =$ $15 \div 3 =$ $24 \div 6 =$ $10 \div 2 =$
2. $20 \div 5 =$ $16 \div 4 =$ $18 \div 2 =$ $28 \div 4 =$
3. $14 \div 2 =$ $30 \div 6 =$ $30 \div 3 =$ $25 \div 5 =$
4. $60 \div 6 =$ $50 \div 5 =$ $40 \div 4 =$ $20 \div 2 =$
5. $18 \div 6 =$ $21 \div 3 =$ $24 \div 4 =$ $36 \div 6 =$

6. A workman earned 25 pesos in 5 days. How much did he earn in 1 day?

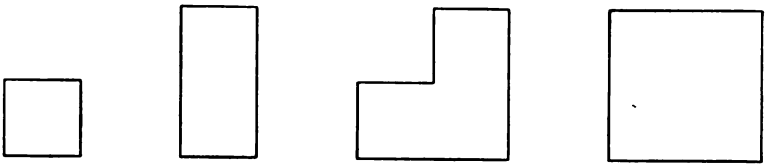
7. Mr. Cid traveled 48 kilometers in 4 days. How far did he travel each day?

8. What is $\frac{1}{5}$ of 25? Of 40? Of 55? Of 60?

9. What is $\frac{1}{6}$ of 30? Of 48? Of 72? Of 36?

10. Juana gave 18 roses to her friends. Each friend got 3 roses. To how many friends did she give them?

11. Luis took 48 chicos to market and sold $\frac{1}{4}$ of them. How many chicos did he sell?



79. Oral.

1. A is what part of B? Of C? Of D?
2. How many A's make C?
3. How many B's make D?
4. If A is 2, what is B? What is D?
5. If D is 12, what is B? What is A?
6. If A is 1, what is $A + B + C + D$?
7. If B is 10, what is A? What is D?
8. How many A's make $C + D$?
9. If A is 10, what is C? What is D?
10. Draw a figure twice as large as D.
11. Draw a figure three times as large as B.
12. Draw a figure as large as $B + D$.
13. If A cost 8 centavos, what did B cost?
14. If C cost 15 centavos, what did A cost?
15. If D cost 20 centavos, what did B cost?
16. If B cost 16 centavos, what did C cost?

MULTIPLICATION AND DIVISION

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

In this table, the product of any left-hand number and top number is opposite the first and under the second. Thus, $3 \times 4 = 12$, 12 is opposite 3 and under 4. Reading across the rows gives practice in counting by the different numbers from 1 to 12. The pupils are expected to formulate the multiplication tables from this table after it has been explained by the teacher.

80. Oral.

1. Make the table of 7's and learn it.

2. Seven squares have how many corners?

3. If 1 chair costs 3 pesos, what will 7 chairs cost?

4. How many chupas are there in 7 gantas?

5.	$7\times 2=$	$7\times 3=$	$7\times 4=$	$7\times 5=$
6.	$3\times 8=$	$5\times 7=$	$6\times 7=$	$4\times 7=$
7.	$7\times 8=$	$8\times 6=$	$7\times 9=$	$8\times 7=$
8.	$4\times 12=$	$10\times 7=$	$9\times 3=$	$5\times 11=$
9.	$7\times 10=$	$7\times 11=$	$7\times 12=$	$12\times 7=$

81. Oral.

1. How many 7's are there in 14? In 21?

2. $7\overline{)35}$ 3. $7\overline{)42}$ 4. $7\overline{)49}$ 5. $7\overline{)70}$ 6. $7\overline{)77}$

7. Sixty-three gantas of water fill 7 jars of equal size. Each jar holds how many gantas?

8. In 7 gantas there are how many liters?

9. Alipio gave 7 centavos each for 7 melons. How much did they all cost?

10. There are 35 liters of milk in a jar. How many times can I dip out 7 liters?

11. Seven triangles have how many sides?

12. $7\div 7=$ $56\div 7=$ $63\div 7=$ $84\div 7=$

13. One seventh of 14 kilos is how many kilos?

14. Twenty-eight days are how many weeks?

15. What is $\frac{1}{7}$ of 21? Of 49? Of 77?

16. How many decimeters in 7 meters?

Let the pupils make 4 problems, using the examples in 12.

82. Oral.

1. Make the table of 8's and learn it.

2. Draw a line 2 centimeters long. Draw another line 8 times as long. How long is the second line?

3. Carmen planted 8 rows of seeds, putting 6 seeds in each row. How many seeds did she plant?

4.	$8\times 4=$	$3\times 8=$	$8\times 3=$	$8\times 2=$
5.	$5\times 8=$	$8\times 5=$	$6\times 8=$	$8\times 6=$
6.	$8\times 7=$	$6\times 9=$	$8\times 8=$	$7\times 4=$
7.	$9\times 3=$	$8\times 9=$	$4\times 10=$	$8\times 10=$
8.	$3\times 11=$	$8\times 11=$	$8\times 12=$	$12\times 8=$

83. Oral.

1. What is $\frac{1}{8}$ of 8? Of 16? Of 80? Of 48?

2. $8\overline{)40}$ 3. $8\overline{)32}$ 4. $8\overline{)56}$ 5. $8\overline{)64}$ 6. $8\overline{)72}$

7. If 1 dress costs 8 pesos, how many dresses can I buy with 40 pesos?

8. Forty-eight desks were placed in 8 equal rows. How many desks were in each row?

9. I have 8 baskets holding 4 liters each. How many liters of rice will fill them all?

10.	$48\div 8=$	$88\div 8=$	$96\div 8=$	$80\div 8=$

84. Oral.

1. Make the table of 9's and learn it.
2. In 9 weeks there are how many days?
3. Nine decimeters equal . . . centimeters.
4. If you are in school 4 hours in one day, how many hours shall you be in school in 9 days?

5.	$9 \times 1 =$	$9 \times 3 =$	$9 \times 5 =$	$9 \times 7 =$
6.	$1 \times 9 =$	$3 \times 9 =$	$5 \times 8 =$	$7 \times 6 =$
7.	$9 \times 6 =$	$9 \times 8 =$	$9 \times 10 =$	$9 \times 4 =$
8.	$9 \times 9 =$	$2 \times 9 =$	$5 \times 9 =$	$9 \times 11 =$
9.	$12 \times 7 =$	$10 \times 6 =$	$8 \times 9 =$	$8 \times 12 =$

85. Oral.

1. How many 9's are there in 18? In 36?

2. $9)\underline{27}$ 3. $9)\underline{63}$ 4. $9)\underline{72}$ 5. $9)\underline{90}$ 6. $9)\underline{99}$

7. A farmer made 45 hektars of land into 9 equal fields. How many hektars were there in each field?

8. What will 9 boxes of candy cost at 10 centavos a box?

9. I paid 72 centavos for 9 yards of lace. What did 1 yard cost?

10. $45 \div 9 =$ $9 \div 9 =$ $81 \div 9 =$ $54 \div 9 =$

Let the pupils write the table of 9's.

REVIEW OF MULTIPLICATION AND DIVISION

86. Oral.

1. Count by 5's to 100. Count by 10's to 100.
2. How many 5's are there in 50, 30, 55, 60?
3. Give the tables of 6's and 7's.
4. How many 6's are there in 12, 30, 42, 60?
5. How many 7's are there in 21, 35, 49, 63?
6. How many 10's are there in 40, 70, 80, 20?
7. Count by 8's to 96. Count by 9's to 99.
8. How many 8's are there in 24, 40, 72, 88?
9. How many 9's are there in 18, 36, 63, 81?
10. In 36 chicos there are how many dozen?
11. Pablo earned 30 pesos in 6 weeks. How many pesos did he earn in 1 week?
12. If one pod holds 7 seeds, how many pods will hold 28 seeds?

13.	$2 \times 9 =$	$\frac{1}{4}$ of $16 =$	$7 \times 7 =$	$40 \div 4 =$
14.	$\frac{1}{2}$ of $6 =$	$6 \times 5 =$	$50 \div 5 =$	$8 \times 7 =$
15.	$3 \times 8 =$	$36 \div 4 =$	$3 \times 12 =$	$\frac{1}{3}$ of $27 =$
16.	$4 \div 2 =$	$7 \times 12 =$	$2 \times 10 =$	$15 \div 5 =$
17.	$7 \times 5 =$	$8 \times 3 =$	$8 \times 8 =$	$\frac{1}{6}$ of $72 =$
18.	$30 \div 6 =$	$\frac{1}{3}$ of $12 =$	$9 \times 4 =$	$6 \times 11 =$
19.	$9 \times 9 =$	$6 \times 6 =$	$42 \div 7 =$	$\frac{1}{2}$ of $24 =$

20. If Maria can write 63 words in an hour, how many words can she write in $\frac{1}{3}$ of an hour?

21. A mother gave 35 centavos to her children. Each child got 7 centavos. How many children were there?

22. One square has 4 equal sides. How many squares can I make with 28 equal lines?

23. There are 30 banana plants in 6 equal groups. How many are there in each group?

24. At 3 centavos each, how many pencils can I buy with 36 centavos?

25. How many meters around a table 3 meters long and $1\frac{1}{2}$ meters wide?

26. A jar holds 72 liters and a can holds 9 liters. How many times can I fill the can from the jar?

27. Nicolas wants to buy a comb that costs 20 centavos. He has 10 centavos and 8 half-centavos. How many more centavos must he have to buy the comb?

28. Luz bought at the Postal Savings Bank 3 5-centavo stamps, 3 10-centavo stamps, and 1 20-centavo stamp. How much did she pay for all of them?

GENERAL REVIEW

87. Written.

Add:

1.	2.	3.	4.	5.	6.	7.
2	4	3	1	6	8	9
3	2	6	7	8	8	9
9	5	8	3	3	8	9
7	6	2	9	7	6	9
2	3	9	2	7	6	3
5	8	8	5	2	6	3
6	7	8	4	5	6	3

8.	9.	10.	11.	12.	13.
23	14	35	13	42	38
36	42	42	45	6	20
40	43	11	31	31	40

Subtract:

14.	15.	16.	17.	18.	19.
63	52	38	92	85	79
7	5	9	32	22	65

20.	21.	22.	23.	24.	25.
94	81	74	56	46	83
6	7	8	9	7	6

26.	27.	28.	29.	30.	31.
87	73	89	99	85	97
63	42	27	63	35	42

Multiply:

32.	33.	34.	35.	36.	37.
7	3	11	12	8	6
9	8	5	6	7	8

38. 5	39. 9	40. 8	41. 5	42. 12	43. 11
9	6	8	10	7	7
44. 7	45. 8	46. 5	47. 9	48. 12	49. 8
7	6	5	8	5	12

Divide:

50. 2)86	51. 4)48	52. 9)81	53. 7)63	54. 3)66
55. 5)55	56. 2)82	57. 3)27	58. 4)32	59. 6)36
60. 8)24	61. 5)40	62. 9)54	63. 6)30	64. 7)56

88. Oral.

1. If $\frac{1}{2}$ dozen papayas cost 20 centavos, what will be the cost of 1 dozen? Of 2 dozen?

2. Ruperto has 24 bananas. If he eats 4 a day, how many days will they last?

3. If $\frac{1}{4}$ of a pound of coffee costs 10 centavos, what will 1 pound cost?

4. How many decimeters are there in 1 meter? In $1\frac{1}{2}$ meters? In 2 meters? In $2\frac{1}{2}$ meters?

5. If Ricardo worked 4 days each week, how many days did he work in 6 weeks?

6. Thirty-three pupils belonged to our school. If $\frac{1}{3}$ of them were absent, how many were present?

7. At 50 centavos a pound, how many pounds of butter can you get for 75 centavos?

8. At 12 centavos each, how many bottles of milk can be bought for 60 centavos?

9. From a piece of sinamay 32 yards long a merchant sold 8 yards. How many yards were left?

10. If Gregorio earned $\frac{1}{2}$ of a peso in a day, how long did it take him to earn 3 pesos?

11. How many lemons in $\frac{1}{4}$ of 3 dozen?

89. **Written.**

1. Write in words: 93, 45, 64, 17, 85, 72, 53.

Write in figures:

2. Seventy-one
3. Nineteen
4. Forty-nine
5. Sixty-six
6. Eighty-two
7. Twenty-four
8. Thirty-seven
9. Ninety-five
10. Twenty-six
11. Seventy
12. Seventeen
13. Forty-eight

14. It took 84 yards of fence to inclose a square garden. What was the length in feet of one side of the garden?

15. Conrado earned $\frac{1}{5}$ of 50 centavos. If he spent $\frac{1}{5}$ of his money, how much was left?

16. Alfonso needs 78 meters of rope. He has a piece 13 meters long and another piece 22 meters long. How many meters of rope must he buy?

17. If I sell oil at 28 centavos a liter which cost 25 centavos a liter, how many liters must I sell to gain 96 centavos?

18. Juan bought a book for 20 centavos, a ball for 17 centavos, and a basket of oranges for 50 centavos. How much less than 90 centavos did he spend?

19. A hammer cost $1\frac{1}{2}$ pesos, 8 kilos of nails cost $\frac{1}{4}$ of a peso a kilo, a shovel cost $2\frac{1}{2}$ pesos, and a rake cost 1 peso. Find the cost of all.

20. Lino saved the money he earned by buying stamps at the Postal Savings Bank. He bought 5 5-centavo stamps one week, 3 10-centavo stamps the next week, and 2 20-centavo stamps the third week. How much did he save in the three weeks?

21. Lino's father has 59 pesos in the Postal Savings Bank. If he takes out 15 pesos to spend for clothes and 13 pesos for rice, how much will he still have in the bank?

SEAT WORK FOR PART I

The teacher's collection of small objects for use in illustrating the combinations taught may be used to furnish seat work for the pupils. The seat work should usually follow the recitation in order to reënforce the points presented.

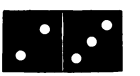
Materials. — Keep the seeds, stones, sticks, shells, nails, etc., in small boxes, each box containing 30 or 40 objects of one kind. Have as many boxes as there are pupils in the class. Since small sticks are easily obtained and convenient to handle, have a large box of these of uniform size and shape. For occasional seat work supply each pupil with a handful from the large box of sticks. Provide enough small, flat seeds to supply each pupil with a handful. Using large cards, write on each card one of the figures 1 to 9, making each figure about 1 decimeter high. The pupils are to use the cards and seeds together, outlining the figures with the seeds.

Pages 9, 10. — Distribute the boxes of small objects, and tell the pupils to show the numbers 1, 2, and 3 with the objects. Give out the cards containing the figures 1, 2, and 3 and the seeds to outline the figures.

Page 12. — Show the pupils how to tear strips of paper about 20 centimeters long and 1 centimeter wide into small squares. Ask them to show 1, 2, 3, 4, 2 + 1, and 3 + 1 with the paper squares.

Page 13. — With sticks let the pupils make garden fences — any original arrangement. With small objects or seeds to represent some familiar plant, let them set out rows of 4 each in as many different ways as possible.

Page 15. — Give each pupil a card 2 centimeters by 4 centimeters. Draw on the board this domino and show how it represents 2 + 3. Ask the pupils to draw dominoes by drawing around the cards, to show 1 + 1, 1 + 2, 1 + 3, 1 + 4, 2 + 2, and 3 + 2 with dots, and to write under each domino the number of dots it contains.



Pages 17, 18, 19. — Let the pupils copy the last 3 lines on page 17 and supply the names of objects and the answers. Draw several domi-

noes on the blackboard, placing dots in one half of each. Let the pupils copy the dominoes and draw in the blank half of each enough dots to make 6. See suggestion for page 13. Substitute 6 for 4.

Pages 20, 21, 22. — Let the pupils make new designs with sticks, using 6 sticks for each design. Let them copy all the exercises on page 20 where + and = are used, and supply the missing numbers. With paper squares (see suggestion for page 12) let the pupils illustrate the combinations at the bottom of page 21. Give out the large cards and seeds to outline the figures 4, 5, and 6.

Pages 23, 24, 25. — Let the pupils copy the dominoes on page 23 and write under each the example corresponding to it; for the first, $2 + 4 = 6$, etc. Write on the blackboard the number combinations on page 25, have the pupils arrange the leaves, squares, and circles they have brought to show these combinations, and write a number story about each one they have shown.

Pages 26, 27, 28. — In the recitation give many oral problems, such as, "I have 7 flowers. How many more must I have to make 9 flowers?" "I see 8 birds on a fence and 2 in a tree. How many birds do I see?" Let the pupils show the combinations $6 + 2$, $7 + 2$, and $8 + 2$ with objects, and write what they have shown. Give much practice in making problems. Let them copy the examples at the bottom of page 28 and write the answers.

Pages 29, 30. — Give out the large cards and seeds to outline 7, 8, and 9. Let the pupils show 2×4 by arranging objects in 2 groups, 4 in each group, and 4×2 with 4 groups, 2 in each group.

Page 31. — Let the pupils draw wheels with 8 spokes in each. Let them make gardens by fencing with sticks, and divide each into 8 beds.

Pages 33, 34, 35. — Let each pupil lay with sticks a line as long as his book; a line twice as long; a line $\frac{1}{2}$ as long; a line $\frac{1}{4}$ as long. Let them lay squares with sticks and divide them into halves and fourths with sticks. Let them draw 2 eggs, 4 fans, 6 lemons, 8 trees, 10 circles, and cross out $\frac{1}{2}$ of each group.

Pages 36, 37. — See suggestion for page 23. Let the pupils copy and subtract the examples at the bottom of page 37.

Pages 38, 39. — Let the pupils cut strings, strips of paper, etc., into thirds. Let each pupil make a double house. A family of 10 moves into it. There may be 5 in each room, 6 in one room and 4 in the other, etc. In how many ways may the family be arranged in the two rooms? Show each with drawings.